1960

Safety Maintenance

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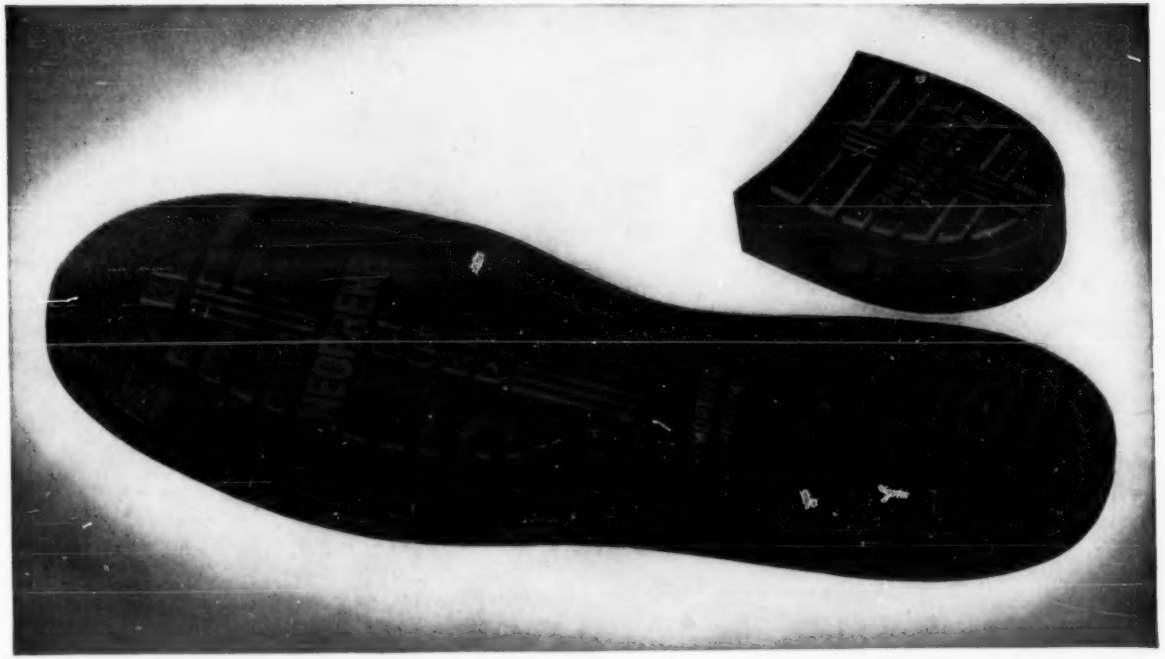

(For details, use Key # N-1 on cord on page 11)

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BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE. To obtain copies write in the key numbers on the free-postage card below.

MATERIALS HANDLING

Sling Chain Safety 239
The McKay Co. This 6-part kit offers a complete guide to sling chain safety for anyone involved in the purchase, servicing or use of chains for materials handling. The kit is comprised of 5 folders, each dealing with a different aspect of the care, use and inspection of chains. Includes safety cautions, working load limits, care and maintenance.

Magnesium Handling Equipment.. 240
Brooks & Perkins, Inc. This illustrated folder summarizes a line of handling equipment made from strong but light-weight magnesium. Folder includes data on two-wheeled hand trucks and four-wheeled bin trucks, platform and shelf trucks, transfer trucks, etc.

Four-Wheel Steer Industrial Tractor 241
Napco Industries, Inc. Illustrated brochure describes a new type of industrial tractor whose features permit unusual versatility: 4-wheel drive, 4-wheel steering (to permit both oblique movement and shorter turning), 4-wheel brakes. The folder shows several of the attachments that can be used with the unit, such as sweeper, dozer blade, forklift, etc.

Adjustable Dockboards 242
The Kelley Co. This new informative kit includes data of interest to anyone planning a new or improved loading dock. The booklet contains minimum design standards and efficiency ideas to speed the in-and-out movement of trucks, and features an adjustable dockboard with illustration of its uses in, on top of, and in front of dock facilities.

Metal Mesh Slings 243
Cambridge Wire Cloth Co. This illustrated bulletin shows how plastic-coated metal mesh slings perform delicate jobs of handling without harming surfaces. Missile handling is the specific example shown.

PERSONAL PROTECTION

Industrial Glove Selector 244
Pioneer Rubber Co. This compact selector chart facilitates the choice of hand protection whether the factors involve chemicals, abrasion, temperatures, worker fatigue, degree of dexterity, or protection of products. From a "Job Condition Check List" the specific hand protection problem is quickly evaluated. Then this information is applied to one of four keys on the slide selector chart. At a glance, the right glove for the specific job is indicated from a variety of 57 glove models. This unusually useful guide also includes a performance data chart which shows the resistance of various glove materials to many commonly used chemicals.

Eyeshade Spectacle 245
U. S. Safety Service Co. Illustrated bulletin describes an all-plastic safety spectacle that provides protection from flying particles and incorporates an eyeshade against overhead glare, particles and splashes. Recommended uses for the spectacles are given and drawings show side-shield lenses and how lenses are changed.

Plastic-Coated Gloves 246
Star Glove Co. This bulletin describes and illustrates various types of work gloves coated with a plastic material to protect the hands from chemicals and liquids. Includes full-coated and partial-coated gloves with knit-wrist, band and gauntlet styles. A full list of the company's other safety gloves is included.

Coated Safety Gloves 247
Mine Safety Appliances Co. A broad line of coated fabric work gloves is described in the illustrated bulletin, including neoprene, natural rubber, and vinyl in standard, flexible and super-flexible styles. Glove linings are jersey, canton, flannel and interlock fabric. Chart evaluating chemical resistance of glove materials included.

FIRE PROTECTION

Fire Extinguishing Systems 248
Cardox Div., Chemetron Corp. Newly revised booklet lists principal causes of large-loss fires, advantages of carbon dioxide extinguishing systems, and examples of installations in steel, manufacturing, aircraft, electrical, publishing and other industries. It shows protection for generators, flammable liquids, paint spray booths, dip tanks, etc., and describes components of high- and low-pressure systems.

Fire Fighter's Clothing 249
Wheeler Protective Apparel, Inc. Illustrated 8-page brochure provides data on fire fighter's clothing and protective equipment. Includes several types of fire-approach and fire-entry suits, hoods and helmets, oxygen breathing apparatus, gloves and boot covers, power megaphones, fire blankets and salvage covers. Clothing available in several types of aluminized fabrics.

FIRST AID & HYGIENE

Marine First Aid Kits 250
Pac-Kit Co. A water-tight first aid kit for marine use is described in this folder. The kits, which float on the water, are of the unit-package type and meet U. S. Coast Guard requirements. Contents of four different sizes are listed.

(Continued on the next page)

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Free Bulletins (Cont'd)

Resuscitator-Inhalator 251
Oxygen Equipment & Service Co. Illustrated bulletin describes a combination resuscitator-inhalator-aspirator whose versatility makes it particularly useful for emergency squads, civil defense teams, and fire and rescue squads.

Air Sampling Filter Paper 252
Gelman Instrument Co. Bulletin features a glass-fiber filter paper designed primarily for air sampling to collect dusts and aerosols. It outlines the paper's filtering efficiency, effectiveness in high temperatures and low air resistance; and gives details on two types of paper.

PLANT MAINTENANCE

Industrial Vacuum Cleaner 253
Incinclible Vacuum Cleaner Mfg. Co. New 4-page folder shows how heavy-duty industrial vacuums are used to clean, reclaim, process and convey materials. In addition to regular maintenance, it describes the cleaning of boiler tubes, removing chips and used coolant. Folder outlines range of models and illustrates special units for hazardous locations and textile applications.

Portable Steel Scaffolds 254
Baker-Roos, Inc. This 16-page brochure shows versatility of the single unit scaffold as well as numerous possible set-ups with multiple units. It details the construction features of the units and gives data on a complete line of accessory equipment.

Corrosion Prevention 255
Corrosion Reaction Consultants, Inc. How to prevent corrosion of metals by means of a liquids formula is described in this 8-page catalog. Useful in metal manufacturing and maintenance, the product can be used on iron, steel, aluminum, brass, copper, magnesium, etc., either bare, plated or painted. Folder shows how it works and gives specifications.

Disposable Paper Wipers 256
Scott Paper Co. This illustrated field study report shows how the use of disposable paper wipers saved time, and money, and made plant housekeeping more efficient in a metal-working plant.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
106	Respirators & Masks
107	Protective Clothing
108	Women's Protective Clothing
109	Safety Belts
110	Safety Gloves
112	Anti-Slip Soles
113	Oil-Resistant Soles
114	Welding Helmets
	FIRST AID AND HYGIENE
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Wash-up Facilities
124	Salt Tablets
125	Resuscitator Tubes
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
130	Throat Medication
131	Eye Wash Fountains
135	Hearing Protectors
	FIRE PROTECTION
140	Fire Extinguishers
142	Fire Alarms
143	Safer Solvents
144	Degreasing Machines
146	Asbestos Textiles
147	Incinerators
148	Watchmen's Control Systems
149	Fire Blankets

Key Number	Subject
	LIGHTING AND WARNING DEVICES
150	Alarms & Warning Lights
151	Powered Megaphones
153	Fluorescent Lamp Guards
154	Emergency Lights
	MAINTENANCE
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Floor Cleaning Machines
169	Toilet Sanitizers
	LADDERS & HANDLING
170	Ladders
171	Ladder Safety Devices
172	Scaffolds
173	Work Platforms
177	Carboy Pumps
	GUARDS
179	Power Press Feeders
180	Safety Tools
181	Vacuum Sheet Lifters
182	Valve Operators
184	Safety Lock-Outs
	EDUCATIONAL AIDS
191	Safety Signs
192	Safety Awards & Emblems
193	Employee Safety Guide
198	Changeable Letter Signs

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Safety Maintenance

formerly "SAFETY ENGINEERING"

Volume 119, Number 1 **January, 1960**

EDITORIAL

New Processes, New Hazards 4

ACCIDENT PREVENTION

For Fixed Ladders—Safety All the Way 7
How to Cut Baling Wire Hazards 8
Conveyors Are For Small Plants, Too 12
(materials handling series) by DR. MORRIS ASIMOW and I. L. M. BOSTICCO
National Safety Congress: Part 2 19
How to Fight Solvent & Static Hazards 43
by CHARLES V. WATSON
New Accident Prevention Bulletins 1
New Accident Prevention Products 60

MAINTENANCE

X-Ray Double-Take Spots Flaws 11
Keeping Up With Recent Floor Maintenance Developments 48
(floor maintenance series)
New Maintenance Bulletins 1
New Maintenance Products 60

INDUSTRIAL HYGIENE

Industrial Hygiene News 27
Techniques of Laboratory Ventilation 28
(dust & fume control series) by JAMES E. BARRETT
The Safety Limits of Hazardous Materials 33
New Industrial Hygiene Bulletins 1
New Industrial Hygiene Products 60

FIRE PROTECTION

The Fire Front 41
How to Fight Solvent, Static Hazards 43
by CHARLES V. WATSON
Warehouse Guarded By Remote Control 45
New Fire Protection Bulletins 1
New Fire Protection Products 60

SPECIAL DEPARTMENTS

Bulletins & Catalogs 1
Reader's Inquiry Card 1
What's Your Problem? 2
The Future Shows 5
"Safety Maintenance" Salutes 20
Another Accident Checked 22
The Safety Shelf 36
Achievements & Awards 39
What's the Law? 47
Safety On Film 58
Inside the Trade 59
What's New? 60
Semi-Annual Index: Vol. 118 65
Index to Advertisers 66

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

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it's SAFE to say

● NEW PROCESSES, NEW HAZARDS

As fast as some new invention or discovery comes along, a way must be found to cope with possible "side effects." Even certain antibiotic wonder drugs cannot be tolerated by many individuals and require further study to permit wider acceptance.

A case in point comes sharply into view as the result of a recent SAFETY MAINTENANCE article describing insulated protective clothing used in many industries to guard workers against the effects of biting cold temperatures. The printing ink in the text was hardly dry when a safety engineer of an internationally known organization spelled out certain fire hazards inherent in the chemically treated foam used in insulating the cold-combatting garments. The subscriber attached to his letter a sample of the material which, upon being put to flame test in this office, disintegrated in a puff of smoke quicker than we could say National Board of Fire Underwriters!

The safety engineer, associated with a firm of engineers and consultants, emphasized that "some types of soft cellular foam material are highly flammable and will maintain a fire once ignited" (he's telling us!). Apparently, there is on record at least one case where a workman, wearing a jacket insulated with a type of foam material, was standing close to an open fire at an outdoor construction project. He became a human torch.

Other types of insulating material readily will disintegrate into a hot, clinging, sticky film when exposed to flame or a high degree of heat.

Dramamine may prevent sea-sickness but it can make the patient drowsy or even very sleepy for days. Penicillin may combat an internal infection but, in certain individuals, it can set up its own toxic condition. Ether produces deep anesthesia but it has been known to cause serious pneumonia.

Just as other innovations seem to be the solution to numerous safety problems, soft cellular foam, as a component of clothing, has many excellent characteristics but, according to our own office experiment, some types of foam are flammable to a degree nothing short of alarming.

It is true that insulated, protective clothing hardly would be exposed to probable ignition when used in a cold storage or freezer area. Nevertheless, it is suggested for and used in outdoor occupations such are marine, aircraft, utility and construction industries where the potential danger from a fire hazard would be intensified tremendously.

Winter liners for safety hats resist bitter cold when made of soft cellular foam which provides comfort, lightness and high insulation properties. But if those winter hat liners can burst into flame because of exposure to a welding spark, electrical flash or match flame, then the wearer must be briefed with an emphatic warning to stay away from the presence of probable danger.

It is true that under certain circumstances, carbon tetrachloride is a most efficient fire extinguishing agent, but its effects can be deadly when and where that chemical is used improperly. It has been reported that certain types of plastic frames used for safety goggles can be burned very readily. Proper warnings, however, make this danger negligible. So it is in the case of highly flammable foam insulation.

We are confident that American know-how will solve this problem and not merely substitute a greater hazard for the lesser. In the meantime, dispensers of foam-insulated clothing have the obligation to stress the fire hazard and require fire prevention procedures while using that material.

THE FUTURE SHOWS

Philadelphia, Pa. *January 25–28*

Eleventh Plant Maintenance & Engineering Show and Conference (Convention Hall). Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

San Francisco, Calif. *February 16–17*

Tenth Annual California Statewide meeting of the Governor's Industrial Safety Conference (Fairmont Hotel). Michael Flagg, Coordinator, % Dept. of Industrial Relations, 965 Mission St. (Room 400), San Francisco, Calif.

Fort Wayne, Ind. *March 15–16*

1960 Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, Safety Council Manager, Chamber of Commerce Building, Fort Wayne, Ind.

Boston, Mass. *March 21–22*

Thirty-ninth Annual Massachusetts Safety Conference and Exhibit (Hotel Statler). Bert Harmon, Manager, Massachusetts Safety Council, 54 Devonshire St., Boston 9, Mass.

New York, N. Y. *March 28–April 1*

Thirtieth Annual Greater New York Safety Convention and Exposition (Statler Hilton Hotel). William J. Farley, convention secretary, Greater New York Safety Council, Inc., 60 E. 42nd St., New York 17, N. Y.

Berkeley-Oakland, Calif. *Mar. 29–30*

Eighth Annual Northern California Safety Congress & Exhibits (Hotel Claremont). Clinton W. Dreyer, managing director, Eastbay Chapter National Safety Council, 1322 Webster St., Oakland 12, Calif.

Los Angeles, Calif. *April 11–13*

Seventh Annual Western Safety Congress and Exhibit (Ambassador Hotel). Greater Los Angeles Safety Council, 3388 W. 8th St., Los Angeles 5, Calif.

Detroit, Mich. *April 12–14*

Thirtieth Annual Michigan Safety Conference and Exhibit (Sheraton-Cadillac Hotel). Ben Duguid, executive secretary, % Allstate Insurance Co., Detroit, Mich.

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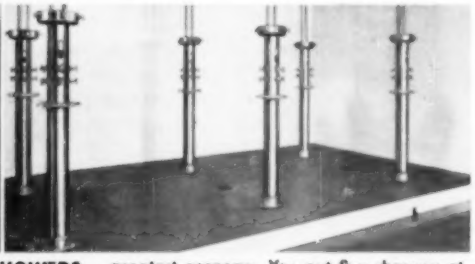
COUNTERTYPE WASHFOUNTAIN has same sanitary features and foot-control, and can be supplied with glass filler faucet and/or bubbler. Bowls are made of stainless steel or vitreous enamel.



BRADLEY MULTI-PERSON SHOWERS are furnished partially assembled for quick installation. They may be supplied with stall-separating partitions and curtains (see upper left), or the Shower Column alone for greatest economy. You get five showers at one installation cost and only three piping connections for all five showers. Each bather has complete control of water volume and temperature. Three heights available, 6', 5'6", and, for smaller folks, —5'.

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(For details, use Key # N-2 on card on page 1)

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- **Lap:** Available in 3 Underwriter's grades
- **Roving:** Soft rubbed or compacted
- **Cord:** Plain, wax sized or starched
- **Yarn:** Plain or metallic ... all grades
- **Wick:** Commercial and other grades
- **Rope:** Commercial and other grades
- **Wovenstone Wire-Woven Wicks:** A tape with inserted brass wire

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DEPT. 219, Bloomington, Illinois

(For details, use Key # N-3 on card on page 11)

FOR FIXED LADDERS — Safety ALL THE WAY

Wherever men climb to work on smoke stacks, towers, derricks, there is danger of falling. A slip, vertigo, sudden sickness, a static charged line, oil or ice on ladder rungs, a falling tool . . . in a split second a man can be killed or maimed. But modern safety devices are preventing these accidents and injuries.

No one knows how many lives have been saved by automatic safety devices for ladders on towers, but to date, there is no record of death or serious injury on any vertical ladder or other framework where the safety device has been used. And it is being used in more than 10,000 different locations and in many countries around the world. The highest known installation is on the 1,450-foot Nashville, Tennessee, television tower, which was finally completed in 1958 after a disastrous initial attempt that saw the mighty tower crumble to earth.

It is now being used on radio towers, rocket towers, rocket launching platforms, high rise lookout positions, telephone poles, power towers, and smoke stacks, to name the major installations, according to a company manufacturing the device.

There are unusual uses for the steel pipe and sleeve safety device, too; like the 35-foot installation in the U. S. Military Cemetery in Luxembourg that is used by a crew to clean the huge monument to General George Patton, colorful World War II tank commander.

Two Principal Parts

The safety device is comprised of two principal parts—the sleeve, which is coupled to a web belt and fastened around a man's waist, and the carrier rail on which the sleeve rides. In position, a carrier rail can be attached to either ladder or pole with equal ease. The sleeve slips over the one-inch ID pipe and thereby the man becomes attached to the ladder he is climbing in a normal manner. If at any time he should slip while climbing he will fall less than six inches, for the sleeve will automatically engage with a notch on the carrier rail and the two will remain fast until physically released.

Notches on the carrier rail are punched at about six-inch intervals. A grade of piping was selected that is consistently ductile enough to take the notch punching without cracking.

The carrier rail is bolted to a hot rolled mild steel channel which does double-duty in holding the sleeve in place as the climber ascends and descends. It also provides a means to fasten the rail to ladder or pole. Both pipe and channel are hot dip galvanized for weather finish. A ladder rung clamp, cast of malleable steel and galvanized, fastens the entire assembly to the ladder.

"It is especially important that the carrier rail in this safety assembly be straight," a company

(Continued on page 26)

How to Cut Baling Wire

Hazards in Cutting Steel Wire

Being under tension, the loose ends, when wire is severed, will snap away from the bale with considerable force. The sharp ends, especially the long one, may strike a person causing cuts or serious puncture wounds to the eye. The person who doesn't know this, whether cutting the wire or standing nearby, is subject to serious injury.

There is danger in cutting wire under tension if the proper tool is not used. Two-handed clippers or bolt cutters, which necessitate use of both hands, should not be used. One hand must be free to hold down the long length of the wire being cut.

Injuries may be caused to a person who takes a position which exposes his face or body to the path of the flying ends of the wire. Fellow workers may be injured in passing by in line with the wire which flies outward when severed. Two men should not work close together.

Cut wire which is not disposed of properly may create a tripping or cutting hazard. Good housekeeping should be maintained.

If a person is injured, he should receive immediate first aid attention. Infection and much unnecessary suffering often result from harmless appearing scratches and breaks in the skin.

For many years wood pulp has been finished in standard 500-pound self-wrapped bales and tied with four or five wires. In many cases little thought has been given to the hazards involved in both placing wires on bales and removing them in the customer's plant.

Mass of Information

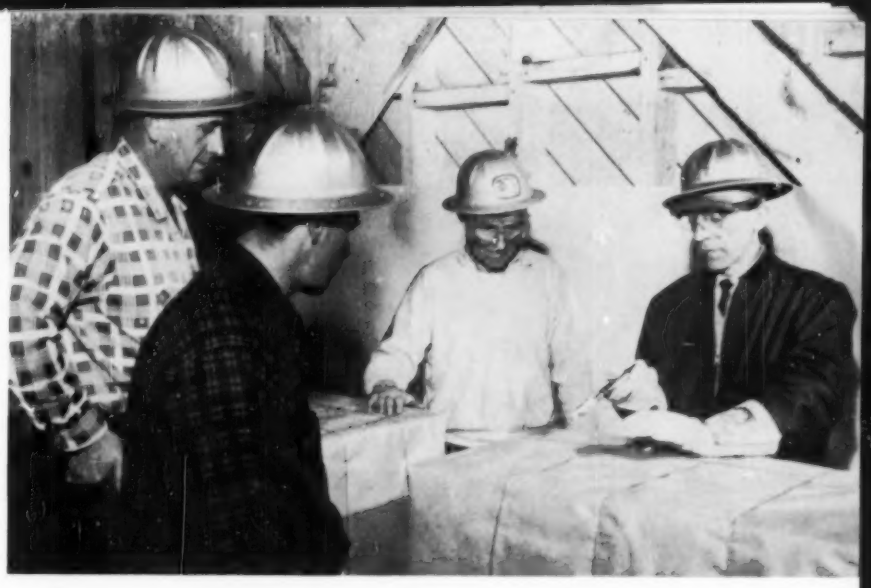
In the process of packaging several hundred thousand tons of pulp each year, Rayonier, Inc. has accumulated a great deal of information on the hazards involved and the ways and means of eliminating accidents, injuries and the resultant costs. Under the direction of Rayonier safety director, Robert M. Gilmore, the company's safety supervisors have assembled this information in the form of a set of rules for cutting and handling baling wire safely.

The accompanying pictures and text are based on the Rayonier safety booklet and are reproduced here with the company's permission as a guide to shipping and packaging department personnel in general industry.

Needs Skill, Experience

Opening pulp or other bales or wired containers by hand is a job requiring skill and experience. If a person does not receive proper instruction or is not given safety equipment to wear to protect him, injuries will result. The foreman of the department should thoroughly inform his employees of the probable action of the wire when cut and should instruct them in the safe procedure to be used in doing the job.

Hazards



Safety Rules for Cutting Wire

1. BEFORE CUTTING wire on bales, workmen should make sure that no other persons are standing where they might be struck by the flying ends of the wire which are released under tension.

2. PROTECTIVE EQUIPMENT: Workmen should wear approved goggles when cutting wire under tension. Metal-frame spectacle-type goggles equipped with side shields and impact-resistant lenses are best; however, the ventilated plastic goggle (shown here) will provide adequate protection from flying wire ends.

Gloves should be worn when cutting and removing wire from baled goods.

Workmen should be encouraged to work with their sleeves rolled down. In a good many cases, scratches will be prevented by a single thickness of cloth covering the forearm.

Pliers or wire nippers are the safest tool for use in cutting wire. A sharp tool is a safe tool. Replace pliers on which cutting edges are worn.

(Continued on the next page)

3. FIRST CUT: To cut wire safely, workmen should place one gloved hand on the wire on top of the bale to hold it down, or grasp the wire close to the pliers to hold it against the bale, while the first cut is made. In addition, the face should be held out of the direct line of the wire being cut. The cut should be made so that neither end of the wire will be directed toward the body.

4. SECOND CUT: A second cut is recommended to reduce the hazard of handling the wire. Short pieces of wire can be handled more safely than long ones and are less likely to entangle or trip personnel.

5. REMOVING WIRE: In removing the wire from beneath the bale after it is cut, bend one end back on itself and grasp this folded portion of the wire with one hand. Take hold of the wire with pliers at the base of the bale to pull it free.

6. DISPOSAL: A container for scrap wire should be close at hand so that cut wire pieces can be safely disposed of as they are cut. Short scrap pieces, especially curved or bent pieces, present a serious tripping hazard and when stepped on will sometimes fly up to cause cuts. The workman who empties the wire disposal containers should wear gloves and safety goggles. Mechanical handling and dumping is safest, if practical.

Plane prep area radiography is part of routine inspection. X-ray head of portable unit is placed at top of stair-platform. Operation is by remote control.

Spot radiographs of welds are made by use of portable x-ray unit. Technician measures lens-to-weld area distance.

X-Ray Double-Take Spots Flaws

Since 1919 New York Testing Laboratories have been performing tests for industry and various agencies of the U. S. Government. The firm has compiled an impressive record of over 300,000 completed test projects encompassing more than 10,000 companies.

They have witnessed the tremendous growth of the aviation industry. They inspected the engine on Lindberg's plane "The Spirit of St. Louis" prior to the historic Atlantic flight and now radiograph aircraft frames and other vital parts of passenger aircraft for some of the leading airline companies.

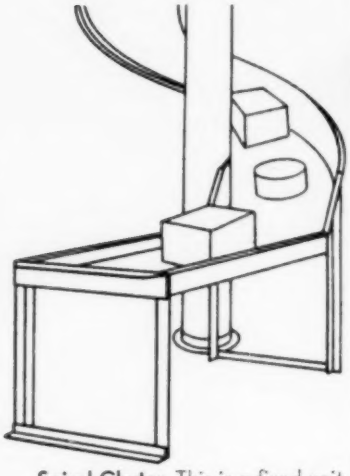
A portable x-ray unit is receiving rugged use by New York Testing in a large range of inspection procedures. Critical areas on aircraft —door frames, wing hinges, tanks, etc.—all come under the machine's scrutiny. New York Testing has used the inspection unit for checking soundness of welds in tanks and piping used for extremely volatile and explosive rocket fuel. Also, they have radiographed piping systems for atomic installations and large ocean going vessels.

(Continued on page 18)

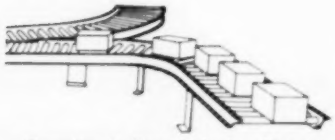
Radiographing critical member of DC-7. Technician sets up x-ray unit to test tank on passenger plane.

Technician approaches plane for radiography. Flaw detection prevents potential product failure in service.

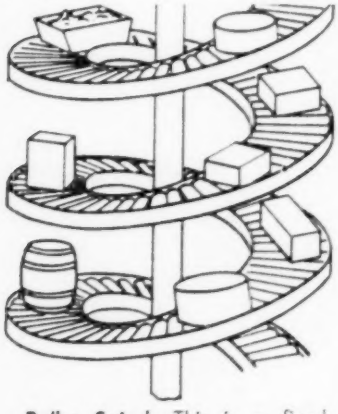
GRAVITY CONVEYORS



Spiral Chute: This is a fixed unit which carries bulk or packaged materials to levels below. This type is suitable for situations in small plants where goods must be sent below for shipment.



Gravity Roller: This is either a fixed or portable, non-power operated unit used to carry packages horizontally or down an incline. It allows the item to be marked, inspected, stored, and weighed in transit. One of the most versatile conveyors, it can be used at unloading tracks and in moving freight to and from shipping rooms.



Roller Spiral: This is a fixed, non-power operated unit for carrying packaged material to lower levels. This equipment can move goods down long vertical distances without taking up much floor space.

CONVEYORS ARE FOR

Manual methods of handling materials are just as hazardous in small plants as in large. Many types of conveyors that cut both accident and production costs can be used efficiently in small scale operations.

If you have lots of manual work, if accidents are on the rise, if materials are "spilling over" into the aisles, if your production machines are located so that your men are continually back-tracking—then it will especially pay you to consider the possibility of installing suitable conveying equipment in your plant. It may be just what you need to cut accident costs, save time, and improve production.

A conveyor, as the term is used here, means a slide, chute, or unattended mechanical device used for transporting materials from one point to another. Such equipment saves labor and improves working conditions.

Conveyors move materials in every state of processing from raw materials to finished goods. In factories they carry materials to, through, and from processing machines of all types and sizes. They may be built-in, forming an integral part of a processing machine, and they may tie whole systems of machines together into a single processing unit. They may be used on field jobs in construction work, inside warehouses, on loading docks, in food processing plants, and in mills and mines.

Nearly All Could Profit

Almost every manufacturer can profit from the installation of some suitable conveyor equipment. In fact, a great many small plants are using simple, low-cost conveyors to excellent advantage.

When a small manufacturer finds himself behind the times and unable to meet competition, he can often make a strong come-back by modernizing his materials handling. This fact is illustrated by the experience of some of the textile mills in high-labor-cost areas. By installing overhead monorail systems (as well as other conveying devices), they were better able to compete with plants in regions where labor costs were lower.

Like Vending Machine

One small manufacturer of personal accessories now stores belts, garters and suspenders in inclined chutes, much like a candy vending machine. A man at a keyboard can pick from stock all items needed to fill orders. In three hours he does a job which used to take three men a full day.

Not all conveyor systems need be elaborate, custom-built models. Sometimes all that is needed is a combination of some off-the-shelf, inexpensive, standard equipment. Often a clever mechanic can adapt a machine to do the necessary job.

For example, a small manufacturer of water heaters faced stiff competition from larger producers. To cut costs he contrived and built (at relatively small expense) a device for drilling the many holes in burner castings. Today he is using the device constantly. Here's how it works.

The conveying element is a turntable. An operator puts a burner casting into an air-clamping fixture. Around the turntable are five drilling positions. A different phase of the drilling is done at each one. The drilling mechanism is simply a movable slide on which is mounted a set of small, electric hand drills. As each cycle is completed a new casting is loaded and a drilled one is ejected. The production rate is now many times what it was previously with a manual drilling operation.

SMALL PLANTS, TOO

by **Dr. MORRIS ASIMOW**
Staff Consultant
and **I. L. M. BOSTICCO**
Staff Writer
Ernest L. Leon & Associates
Management Consultants
Los Angeles, California

Combining conveying with a manufacturing process is often very profitable. Frequently goods which need to be spray- or dip-painted are carried on an overhead trolley. While mounted on this conveyor they enter a spray booth or dip down into a tank. They dry on the conveyor as they move toward an assembly station. In other cases, conveyor carries parts through heat treating furnaces or through sorting operations. Common examples of conveyors in this role are processing of valuable minerals, hand-separation of brass from aluminum scrap, magnetic removal of iron objects from mixed scrap, and the sorting of fruit. Often routine inspection can also be performed more efficiently by use of a conveyor. Usually when a production process can be combined with a conveying operation, the savings are quite substantial.

Choose the Right Equipment

Your handling problem may, of course, be quite different from those illustrated. However, if you have an operation where material is moved from one more or less fixed location to another, you may well be able to cut corners and save money with conveyors. The material may be bulk. It may be coarse or fine, it may be sticky, free flowing, fragile, perishable or quite rugged. It may be parts which are being processed or finished goods already packaged.

You may need to move items in a straight line from one place to another at one level, or from one level to another. You may have to move them straight up or straight down. You may want them to turn corners or be dispatched to one of several locations. In almost any situation there is a type of conveyor especially suited for the requirements. Moreover, in many cases a portable unit can be installed so that locations of entry and exit can be changed.

Because of the great variety of equipment made and the different needs to be met, a conveying system cannot usually be purchased "off the shelf." Often, a conveying system is especially engineered to meet the customer's specifications. Typically it is made up to his requirements as to length, sturdiness, and so on. Some standardized, preassembled units, of course, do exist. For a small operator, they may be very useful. However, you should check your selection with a competent conveyor man.

The choice of the proper equipment presents no real difficulty except for those who have no background in this field. Even then, various sorts of technical help are available from consulting engineers and engineering representatives of conveyor manufacturers.

Two General Classes

There are two general classes of conveyors: gravity conveyors and powered conveyors. The main types of both classes are shown in the accompanying illustrations.

In order to arrive at the most suitable conveying system for your materials handling problem, you will have to take into consideration the following factors:

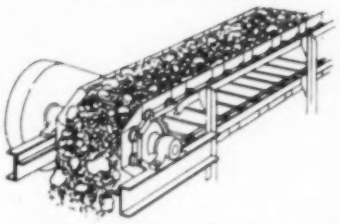
1. What kind of material are you moving? Heavy or light? Bulk or solid? Sturdy or fragile?

2. How much material do you need to move? Make a list of all the materials, assemblies, and com-

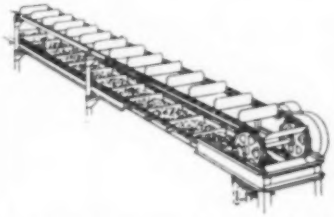
(Continued on page 16)

MATERIALS HANDLING SERIES
other articles in Feb. & March

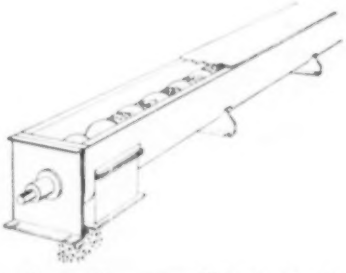
POWER CONVEYORS



Apron Conveyors: This is a fixed or portable, power-operated unit for carrying sturdy bulk or packaged material either horizontally or up and down an incline. It is usually made up of steel interlocking pans, propelled by one or more strands of chain and supported by the chain and sometimes also by rollers. It forms in effect a moving table and allows material to be processed or inspected in transit. This type of conveyor is suitable for industries handling heavy, unwieldy, and hot materials.



Flight Conveyor: This is a fixed, power-operated unit made up of (a) one or more endless propelling media (like a chain) to which a series of spaced plates is attached, plus (b) a trough through which material is pushed by the flights. This type of conveyor is often used by small rendering plants and by manufacturers of nuts and bolts or other small metal parts.



Screw Conveyor: This is a fixed or portable unit used to carry loose material in any direction. It consists of a revolving screw-shaped shaft mounted in a suitably shaped stationary casing or trough. As it revolves it pushes materials poured into the trough forward to the exit. This type of conveyor can be used in many different industries.

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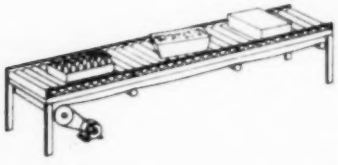
POWER CONVEYORS

En-Masse Conveyor: This is a fixed, power-operated unit for carrying material in any direction. This conveyor will generally handle most pulverized or granular material. It is used to convey corn flakes and other breakfast cereals among other things.



Live Roller Conveyor: This is a fixed or portable, power-operated unit for carrying material horizontally or up or down a slight incline. It can be used for processing, inspection, storage, and weighing in transit.

Reciprocating Flight Conveyor: This is a fixed or portable unit used to carry material horizontally or up or down an incline. The material is moved by pushplates which advance the material along a chute, then rise and move backward before starting the next cycle. Material is loaded and unloaded mechanically. This type of conveyor is often used in the glass industry for conveying raw materials.

Small Plant Conveyors

(from page 13)

ponents involved in your operation. These will include both production and outside-purchase items.

3. What is your production rate? Units of finished product plus the materials needed per unit will show you how much you have to handle. It is a good idea, if you are planning for a fixed conveyor, to forecast future production rate increases in order to make sure that your planning permits sustained production. Otherwise you will do well to consider a portable conveyor which can serve several purposes.

4. Type of building: single or multi-story.

5. Location of walls and columns.

6. Width of aisles and doorways.

7. Load bearing capacities of floors.

8. Location of utilities.

9. Access of highways and railways.

10. Layout of production machines.

Obviously the choice of the right equipment may present a problem, but expert help is available to you and you would do well to make use of it. A good plan is to consult two or three reputable, local conveyor distributors or manufacturers' representatives. Give them all the information you have on your handling problem and get them to make recommendations and to quote prices on suitable equipment. You will then have no difficulty in reaching a sound decision. Usually, a local distributor's engineer will be glad to help with your new floor plan, if you need help, and in getting your new system running smoothly.

Installation & Maintenance Costs

Installation work will, of course, vary considerably according to the system you choose. If you do not have technically competent people to do your own installation properly, make arrangements with your distributor to have it done. Sometimes a combination of both methods is used. For example, you might decide to have an engineer from the conveyor company instruct and supervise your own men in doing the installation. This approach might save you money and at the same time assure you of a professional job.

Typical Examples

One conveyor manufacturer maintains that a conveying system will offset installation and maintenance costs and will pay for itself in about one year. This will depend, obviously, on both the size of the conveyor and the size and nature of the plant. The president of a company owning 1,000 feet of overhead conveyor track enthusiastically declares that it pays for itself over again every two years.

As with every piece of machinery, proper maintenance is of paramount importance. This is true not only in the successful operation of a conveyor system, but also in assuring its long and trouble-free life. However, proper maintenance need not require long hours of inspection and care. One industrialist whose plant has two miles of overhead track reports that two man-hours per day is sufficient to keep his entire track oiled, tightened, and in good repair. In the same vein, the president of a factory which turns out spring seat frames states that his overhead conveyor system has given him no mechanical trouble, has required no replacements, and needs no maintenance except oiling the carriers and switches.

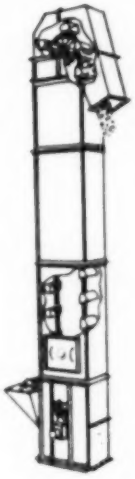
Maintenance

The distributor will be competent to instruct your men on maintenance if you decide to purchase a conveyor system. Many manufacturers of conveying equipment have fine service departments which are set up to provide any information you may need.

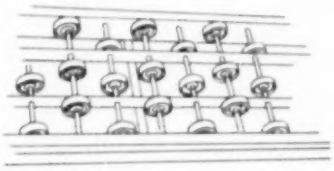
Pictures by courtesy of Conveyor Equipment Manufacturers Association.

City _____ Zone _____ State _____

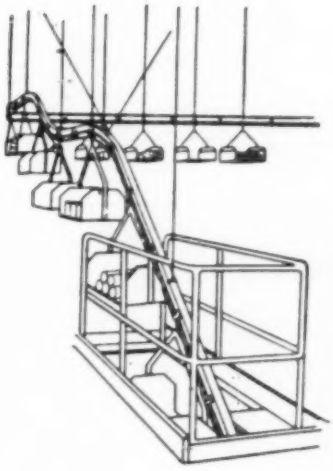
Power Conveyors



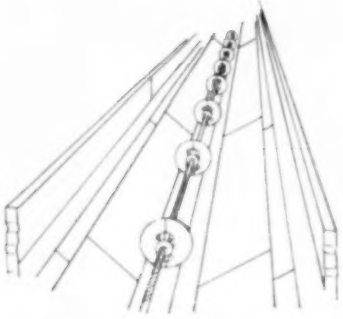
Conveyor-Elevator: This is a fixed or portable unit designed to carry material horizontally or in a vertical direction. It also loads and unloads material mechanically. A variation of this type is the pocket conveyor, much used for carrying bananas.



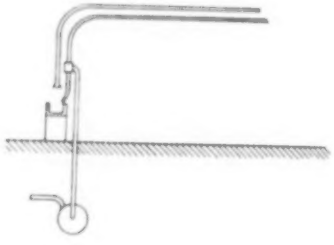
Skate-Wheel Conveyor: This is a fixed or portable unit similar to a roller conveyor for carrying packaged material down an incline. It is particularly suitable for carrying materials around turns and allows for storage and weighing in transit.



Trolley-Conveyor: This is a fixed unit for carrying material horizontally or up or down an incline. It allows for processing, inspection, storage, and weighing in transit. This type of conveyor is well suited for small shops.

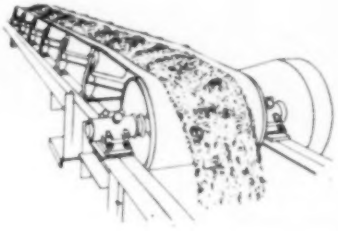


Rope-and-Button Conveyor: This is a fixed or portable unit for carrying bulk material horizontally or up or down an incline. It consists of an endless steel cable with disks (often made of cast iron) split and bolted over the cable so as to clamp it tightly. It can be used in such situations as loading cord wood lumber piles, handling sawdust and shavings, and moving coal.



Pneumatic Conveyor: This is a fixed unit to carry loose bulk material or packaged material in any direction. It consists of an arrangement of tubes or ducts through which the material or objects are moved by air pressure. This system is commonly used for handling grain or similar products in the unloading of ships or barges. It is also common in foundries for conveying sand, in department stores for transporting containers holding sales slips and money, and in newspaper offices to send copy from the editors to the composing room.

Oscillating Conveyor: This is a fixed or portable unit for carrying loose bulk material to a lower point, often into another conveyor. The equipment vibrates fairly slowly, but with fairly large back-and-forth movements.



Belt Conveyor: This is a fixed or portable, power-operated unit carrying granular, semi-fluid, bulk, or packaged material horizontally or up or down an incline. It can be either flat or troughed in shape. The belt can be constructed of woven fabric, covered with rubber or similar material. Some belts are made of wire mesh or occasionally of flexible steel. This equipment allows material to be processed, inspected, or weighed in transit. Among other applications, it can be used in conjunction with a magnetic drum to separate ferrous from non-ferrous metals in a scrap yard.

Insulation Research

The Electronic Industries Association and the American Society for Testing Materials have joined with the National Electrical Manufacturers Association in sponsoring an insulation research project at the University of Delaware, it was announced by Robert W. Jorgensen, chairman of the Laminated Products Section of the NEMA.

The joint study will be directed toward developing a reproducible test method for measuring insulating resistance of high-pressure laminates used for electrical circuits or for printed circuitry in aircraft, missile and electronic applications.

Factors to be studied will include accuracy and constancy of both temperature and humidity control. Tests will be conducted in a new climate laboratory test chamber which maintains controlled humidity at different levels and temperatures. Professor M. G. Young, Chairman of the University's Department of Electrical Engineering, will direct the work. Results of the projects will benefit both manufacturers and users of plastic products by producing better understanding of factors involved in accurate measurements of insulation resistance.

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(For details, use Key # N-4 on card on page 1)

X-Ray Spots Flaws

(from page 11)

G. J. Harvey, Technical Director for the New York Testing Laboratories, said, "The sensitivity of the radiographs produced have picked up some defects that might have been extremely serious. We find the unit particularly handy because of its lighter weight and its shape, which contributes a great deal to ease of handling on the job as well as low maintenance."

"The low maintenance has been especially gratifying to me," Mr. Harvey stated, "because the field work has been extremely rugged and although the casing on the x-ray unit shows evidence of hard use and wear, the operation has been 100 percent."

"Today, products and materials are subject to wear, tear and a tremendous variety of stresses, Mr. Harvey added. We, here at New York Testing, envision an ever-increasing need for non-destructive testing methods to meet both government and commercial demands for safety. Since we must go to 'the work' when 'the work' cannot be brought to us, we believe the portable x-ray unit is one of those inspection devices whose use will grow ever wider in years to come."

The versatile x-ray unit requires very little in the way of safety precautions other than warning signs to keep people at a safe distance from the operation. The technicians set up the x-ray head in the position required for the test. But the radiograph itself is taken by remote control some 50 or 60 feet away, without danger to the operator.

Pictures by courtesy of Balteau Electric Corp.

National Safety Congress:

Preview of the sixties

Part 2

In the December issue of this publication highlights were presented from the addresses of several of the speakers at the 47th National Safety Congress held in Chicago last October. "Safety In the Sixties" was the theme of this annual convention of accident prevention authorities and safety representatives. Following are additional resumes of the past, present and future of safety as seen by some of the country's safety experts.

Industrial Hygiene

Increased safety and putting an end to stream pollution—those are two good will-building activities big business is expressing an interest in these days, according to Wilbur E. Kidder, safety and security manager, Behr-Manning Co., Watervliet, N. Y.

"Corporate management," he said, "is concerned over public and community relations, and is anxious to be known as a good neighbor and good employer.

"Witness the efforts to reduce air and stream pollution, and to encourage community activity by executives."

Ever had difficulty holding down a job? In attending school regularly? In getting along with your wife? Then you possess some of the traits of the accident-prone person.

A study of accident-proneness was reported by C. G. Evans, personnel manager, North American Coal Corp., Cleveland, Ohio. These facts were turned up in the study, according to Evans: Of the accident-prone persons, 1 out of 4 had been fired from his job, 1 out of 4 had a truancy record, and 15 out of 100 admitted marital discord. Even more significant: half of the individuals had appeared in juvenile court.

Hog itch, chrome sores and bone scratches. Those are some of the hazards faced by workers in meat packing, tanning and leather products industries, according to Lucille M. DeMart, occupational health consultant in Liberty Mutual Insurance Co.'s loss prevention medical department, Chicago. She said that industry can't afford to be without a full-time nurse. "Good medical control," she declared, "pays dividends in dollars and cents. The health of workers has a direct bearing on your progress and production."

Ventilation in mines is not just the responsibility of the safety man or ventilation engineer. "It is the responsibility of every man on the job," said John D. McKichan, Michigan Department of Health, Marquette, Mich., "from the general manager to the newest employee."

"The proper design of a ventilation system and its installation," he said, "are the responsibility of management. But it is the duty of every man underground to see that the ventilation system is used and not abused."

More than half the 50,000 miners of Ontario, Canada, have occupations that involve the risk of silicosis, C. S. Gibson, chief engineer and secretary of the committee on silicosis, Mines Accident Prevention Association of Ontario, told the convention. He defined silicosis as a "disease of the lungs due to inhaling excessive amounts of siliceous dust over a long period of years."

"Silicosis cannot be cured. But it can be prevented," he said. He told Congress delegates of the success of efforts to prevent silicosis: "Many lives have been saved and air conditions improved to such an extent that the frequency and severity of disablements due to excessive exposures of dust have been greatly reduced."

Psychiatrists and psychologists are new aids to an industrial safety

SAFETY MAINTENANCE SALUTES

A SAFETY IDEA

Safer Care of Safety Tools

A novel development by the Florida Keys Electric Cooperative Association of Marathon, Florida, has made a distinct contribution to the everyday safety of linemen.

Conventional wooden hot sticks, used almost daily by their linemen for numerous jobs involving high voltage, had always been transported in steel tubes fastened atop trucks. It was found, however, that the abrasive contact between the hot sticks and the container in removal and replacement caused the surfaces of the sticks to deteriorate, requiring refinishing. Also the hot sticks picked up bits of rust and flaked galvanizing, making them potential conductors of electricity.

Phil Lambert, Marathon service supervisor, and J. C. Griffin, superintendent, solved this safety problem by replacing the steel tubes with lengths of 4-inch diameter rigid vinyl pipe. The pipe was fitted with end covers for all-weather protection, and mounted atop the trucks.

The rigid vinyl pipe is an excellent nonconductor, cannot rust or flake off, and has no abrasive property on contact with the hot sticks.

Use of the rigid vinyl containers has practically eliminated the need for maintenance refinishing and preserves the hot sticks in excellent condition for long periods.

Picture by courtesy of B. F. Goodrich Co.

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program, according to Dr. J. H. Hege, medical director, Ohio Oil Co., Findlay, Ohio. "A relatively small segment of the population has a disproportionately large share of life's misfortunes," he said. "Human error is largely responsible for the majority of accidents." He said industry has "sought the aid of psychiatrists and psychologists to define the pattern which appears to be a common denominator in the maladjusted employee."

In coal mines, dust can seriously affect the safety and health of workers; but a new device, still in its early stages of development, may change this. Known as a "through steel dust collector," the device, according to John Zitko, superintendent of the Ireland mine of Hanna Coal Co., Moundsville, W. Va., is expected to "help improve the environment of our workers through the lessening of the amount of dust circulating throughout the working areas. It may greatly improve the health aspect of the job, as well as decrease the number of accidents caused by lack of visibility."

Value of Safety

You can't eat prestige. That paraphrases the philosophy of Emmett K. Olson, Jr., director of safety, Kennecott Copper Co., Salt Lake City, Utah. "It makes little difference to the families hit by fatalities and serious accidents whether a safety award has been received" by their husband's plant, he said.

"Safety is a never-ending job," he said. "As long as there is a single injury to one of our employees, we cannot be satisfied."

A Fairfield, Ala., labor union official predicted that the Utopian goal of "accident frequency zero" will be achieved someday.

"Education," said B. B. Reid, president of a local union of the United Steelworkers of America, "is the answer to many problems. I feel that proper safety education eventually will result in attainment of that Utopian goal.

"Too many people, unconsciously think safety is something for the bulletin board or the safety meeting. We should think of safety as a necessity in industrial operations—like salt is in our food.

"I have faith," said Reid, "that the men and women who constitute America's greatest resource will win a decisive victory over our common enemy—the accident."

What's the beef about hamburger?

"There's nothing wrong with hamburger," Harold E. Brooks, vice president, Armour & Co., Chicago, declared. "Most of us eat hamburger more often than steak. And we probably would continue to do so if both sold at the same price."

Brooks got into the meat subject while decrying attempts to run a "top sirloin safety program" on a "hamburger budget."

Brooks took exception to the thesis that top management should be actively in safety. "Procurement, production and sales are the functions that lead to profit, and profit is the reason for the existence of management—not safety," he said. Safety is a specialized function that must be largely delegated. "So let's be realistic and say that safety is largely a middle management, rather than a top management, function," he said.

Some of the contrasts, and problems, of overseas construction projects—where high-powered machines may work alongside slow-moving donkeys—were told to listeners by Howard J. Schulte, newly appointed chief safety engineer of the U. S. Army Engineer Dist., Kansas City, Mo.

One thing that's not the same overseas as here is the way workers are treated. "The attention we give the safety of the laborers," he said, "is such a departure from the age-old disregard for human life and suffering that the spotlight of favorable public opinion is focused on us in foreign lands."

Radiation Problems

Radiation is pretty frightening to most people, and understandably so. "Radiation hazards," said Harold Hoyle, supervisor, enviromental research laboratory, Dow Chemical Co., Midland, Mich., "have been associated in most people's minds with things mysterious and horrible."

"The fact that the various forms of radiation are not detected by the senses adds to the fear complex. To further contribute to the feeling of fear," Hoyle said, "one finds differences of opinion among the experts concerning the real hazards.

"The result is that the average layman approaches radiation with much misunderstanding and actual fear."

However, the more the merrier—and, perhaps, the more reassuring. That's the opinion of John G. Wood, chief application engineer, Tracerlab, Inc., Waltham, Mass. He told about radiation safety in industry and how many who first used radioisotopes were fearful. "Great progress has been made in allaying these fears," he said.

The large number of persons concerned with radiation—health departments, the Atomic Energy Commission, insurance companies and government agencies—has, Wood said, "helped promote a greater understanding of the hazards involved in the use of radioisotopes. Many people," he said, "find it reassuring to know so many groups are concerned with their problem."

Preplanning, coordination and continuity of job supervision—and safety—go hand-in-hand. So says Denver H. Dierks, safety and fire protection branch, U. S. Atomic Energy Commission, Idaho Falls, Idaho, operations office. He described the safety problems prevalent in the construction of power-reactor containment shells—the containers for atomic reactors.

"Reactor containment vessels," he said, "are likely to be commonplace in the years ahead. It is heartening to realize that construction involving such hazards can be done safely and efficiently."

Accident investigations do more than just reveal where and why an accident occurred. They also help convince employees that you mean what you say about safety, according to John F. Jones, safety supervisor, Commonwealth Edison Co., Chicago. In discussing what constitutes a safety program in a nuclear power station, he said Commonwealth Edison's safety section employs 18 persons—one for every 800 workers. Safety, he said, costs his company about $1. a month for each employee.

That "what to do in an emergency" booklet you keep handy in your home will soon see another situation added to its index—radiation exposure.

"We are approaching the day," predicted Peter Tedeschi, radiation safety representative, Argonne National Laboratory, Lemont, Ill., "when the use of radioactive materials will be just as acceptable as the use of fire.

"People will learn the rules for handling radioactivity just as they learned the rules for handling fire. There will be emergency situations

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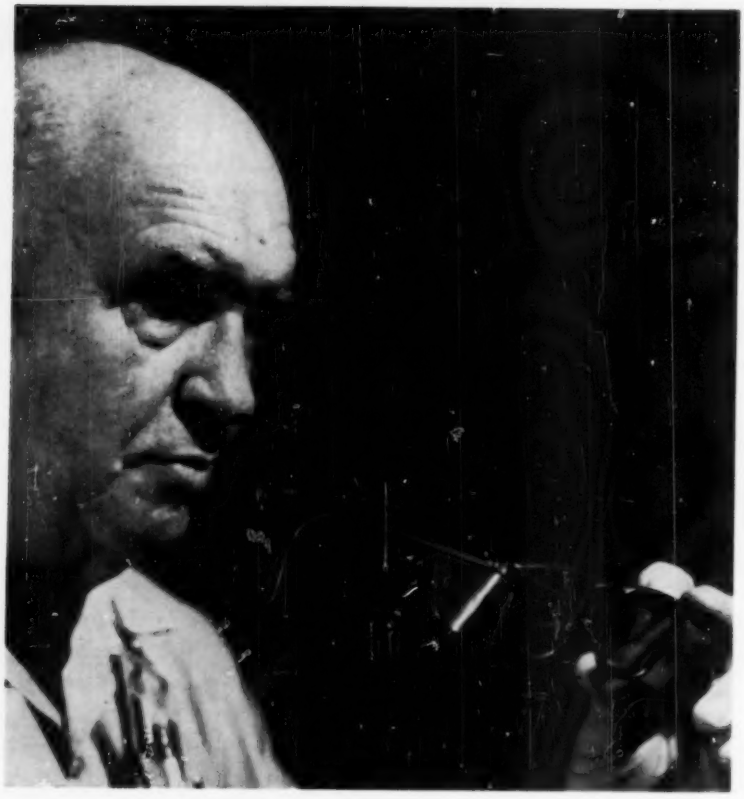

Margin of Safety

By the margin of the thickness of a safety lens John Witte can still see through both eyes.

Witte, 60-year-old mechanic helper in a machine shop at Kelly Air Force Base, was recently working overtime on a Saturday at the base. He had cut halfway through a piece of angle iron with a power hack saw when the saw blade broke. A piece of the saw blade flew up and struck the right lens of Witte's safety glasses.

Although cracked, the lens stayed in the glasses, preventing Witte from possibly losing the sight of his right eye.

National Safety Congress
(from page 21)

involving radioactive materials. Emergency groups must begin to prepare for this new hazard to their work."

Off-the-Job Safety

Nearly 40 million Americans spending more than two billion dollars to go skimming the waves in eight million small boats. That's the frantic picture throughout the nation, according to an official of the American National Red Cross, Charles W. Russell, assistant director, safety services, small craft.

"Boating is a remarkably safe and wholesome recreation when backed up by good judgment, training and experience.

"A newcomer to boating can save a lot of time, and possibly his life," if he will follow these suggestions, Russell said:

1. Don't go boating unless you can swim. Life vests and buoyant cushions are no substitutes for swimming ability.

2. Learn how to operate a small craft. Get professional instruction.

3. Before trying to go out alone, develop boat-handling techniques under the guidance of an experienced operator.

"Unfortunately," Russell said, "many boaters are trying to learn the hard way—by experimenting. About 1,700 persons lost their lives last year in small craft accidents."

Do "do-it-yourselfers" really save money on home repair projects? Or do they pay dearly in ruined health and painful accidents for the privilege of working till nightfall?

These are questions industrial safety men are concerned with, according to John M. McAlpine, supervisor of safety and plant protection for Celanese Corporation of America, Rock Hill, S. C. He said the home is "the most dangerous place we frequent during our normal 24-hour day."

"It need not be this way," he said. "We must control this do-it-yourself urge—at least to those chores we are able and experienced in performing. Learn to relax and enjoy your home," he advised. "Make it a haven from danger. Enjoy every moment you can spend in it."

Off-the-job injuries and how they affect industry were discussed by O. H. Bynum, safety supervisor, E. I. du Pont de Nemours & Co., Camden, S. C. "The control of off-the-job injuries," he said, "presents the most serious safety problem facing industry today." He cited these revealing facts: 1. Seven times as many workers killed nationally going to and from work than on the job. 2. Four times as many Du Pont employees injured off the job as on.

Davey Crocket and Daniel Boone were subjects for discussion by Thomas D. Beven, president of Elgin, Joliet & Eastern Railway Co., Chicago.

"The daring, fearless pioneer," he said, "was one of the most safety-minded individuals of all time."

Neither Davey Crockett nor Daniel Boone ever went into the wilderness without long and intensive preparation. Every hazard was weighed and plans were made to avoid or minimize each danger. The rule was preparedness.

"Compare this with the off-the-job safety attitude of today. Can it be Americans are abandoning their great urge for safety? Today,"

said Beven, "the only real progress in safety is in industry. On all other fronts, safety is near collapse."

"Safety is a 24-hour-a-day job," said Paul E. Edwards, safety supervisor, Socony Mobil Oil Co., Plainfield, N. J. "Accident prevention once meant trying to keep a workman safe on the job," he said. "What happened to him after the whistle blew was little or no concern.

"Today we know that if we are going to get the maximum benefits from our safety efforts, we must consider all phases of accident prevention."

A slowpoke on the highway can be as great a menace as a drunken maniac, asserted the Rev. Francis L. Filas, S. J., professor of theology, Loyola University.

He described himself as a fire prevention expert, of sorts, who who could give "10 easy lessons called the Ten Commandments," on "How to Avoid the Hot Place."

"The safe outlook," said the Rev. Filas, "does not mean a hesitant, fearful outlook. Take the overcautious driver. If he drives too slowly for fear of an accident, if he hesitates too long at intersections—that driver is no longer safe. He is perhaps as much a menace as the drunken maniac."

Tip to job applicants: How loud you play the TV set at home may help determine whether you get the position you're after!

That's the word from John A. DePew, director, safety and personnel, Dohrn Transfer Co., Rock Island, Ill.

One way to hire the right man for the job is to learn as much as you can about the applicant's home life.

"How does he get along at home? Is it run on a cooperative basis? When you call his home, how about the loud background noises of the radio or TV? These could be an index to his way of life."

Safety Equipment

An approaching "revolution" in the public utilities field was described. It involves use of a new device—the line lift—which, according to Harold W. Masters, safety directors, Asplundh Tree Expert Co., Jenkintown, Pa., "can put a lineman in an infinite number of

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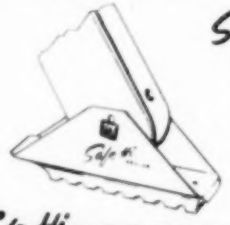

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Safe-Hi Ladder Shoes hold on all surfaces because they combine fibre and neoprene in the tread. This combination holds any ladder safely on wet, dry or slippery surface. The self-sharpening steel spike flips down for ice or snow.

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Other Safe-Hi Safety Belts include Car Dropper's Belt, Grab Belt, Heavy-Duty Construction Worker's Belt and Window Cleaner Belt.

Safe-Hi AUTO SEAT BELT

The "all nylon" Safe-Hi Auto Seat Belt has been safety-engineered to reduce crippling injuries and deaths resulting from highway accidents. The entire belt assembly, including the floor hardware, test far beyond C.A.A. rated strength for airplane seat belts! The 2-inch-wide webbing is 100% nylon, shock-absorbing, very long wearing and easily kept clean. It is light and comfortable to wear, and can be instantly adjusted or released. The Safe-Hi Auto Seat Belt will fit any person, any seat and any car or truck.

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(For details, use Key # N-20 on card on page 1)

positions around the poles and wires on which he works."

"The public utility industry is on the verge of a revolutionary change in its methods of construction, maintenance and service." The line lift, he said, affords the lineman "complete freedom of movement. He can get as close to his work as necessary"—and with a maximum of safety.

"Never' lay down, or leave, a loaded weapon, even for a short time.

"Load the weapon just before use. Keep the safety on until ready to use.

"Never point a gun at any person."

These are tips not for the hunters who tramp through woods and fields, but for the men whose job it is to stun food animals in meat packing houses. The tips were cited by C. H. Eshbaugh, consultant, improved slaughtering methods committee, American Meat Institute, Chicago.

"Stunning of food animals by mechanical, electrical or chemical means," he said, "will help our industry contribute to safety in the years to come."

Industry's No. 1 maimer—the "unprotected power press"—was also the subject of a discussion. "Even with our finest protection," said Harold J. Cotshott, Jr., project engineer of Clark Controller Co., Cleveland, Ohio, "we all recognize the continuing hazard of punch presses. Thousands upon thousands of dollars have been invested in the design of punch press guards —designs which accept the frailty of the human operator and make the guard foolproof."

"Still," he told delegates to the National Safety Council's annual convention, "there are injuries caused by the press worker's mind wandering, and by various types of mechanical failure."

If you've ever had to climb one of those "straight up an down" ladders on a ship, you know how difficult a task it is. Well, you're not the only one who thinks they could be improved on. So does U. S. Coast Guard Cmdr. John H. Hawley, chief, casualty review section.

"It would certainly seem," he said, "that the designers of modern super vessels—cargo, passenger and tankers alike—could find some way to provide for wider ladders of gentler slope and deeper tread. It seems that any added expense would be more than offset by the reduction in accidents and deaths from this source," Cmdr. Hawley said.

"Safety has come a long way—but it still has a long way to go," an executive of Cleveland's Republic Steel Corp. told the National Safety Congress. "When you compare conditions today with those half a century ago," said E. R. Johnson, vice president in charge

of operations, "it is clear that the safety effort has succeeded remarkably well."

"Thanks to modern safety programs," he said, "a man can take a job with the knowledge that he will be much safer on the job than at home or driving his car on the highway.

"But in spite of this, there is a long way to go. We still need more refinements in safety training, in the design of factories and machines, in safety equipment."

The use of construction equipment isn't inherently dangerous, another speaker declared. "The fact that people get hurt in construction operations," said Arthur J. Rutherford, chief of the evaluation engineering branch, U. S. Army Engineer Research & Development Laboratories, Ft. Belvoir, Va., "is being recognized as a necessary evil that must be accepted to get the job done.

"This complacent acceptance of unnecessary loss of life and property is ridiculous. I believe something can and should be done about it. The solution to the problem, in my opinion," he said, "lies in the attitude of the designer and manufacturer of construction equipment. Too often the safety of the equipment operator or mechanic is secondary to machine efficiency and manufacturing profits."

Safety Engineering

It's easy to lock the barn door after the horse is stolen. "It is time," said Earl W. Wheeler, Navy Dept. safety engineer, "for safety engineers to begin practicing safety engineering by foresight—not hindsight. For too long, we have been telling people what they should have done to prevent accidents—after the accidents have happened.

"Every time a new piece of equipment comes out, we sit back and wait to see what happens. This is hindsight safety engineering."

Time passes—but some of the hazards of old are still a problem in industry. Take materials-handling accidents, for example. Twenty years ago, according to Myron L. Miller, supervising safety engineer, East Pittsburgh (Pa.) works, Westinghouse Electric Corp., 1 out of 4 work accidents resulted from handling objects.

Today? Virtually the same situation. Miller said a study of materials-handling mishaps in his plant showed unsafe acts present in almost each instance. In nearly half the accidents, unsafe conditions were reported, he said.

Safety is an integral part of the design of electrical test equipment at Westinghouse Electric Corp. A representative of the firm, F. C. Peregoy, supervisor of safety at Westinghouse's Air-Arm Div., Baltimore, Md., explained its objectives in the manufacture of the test equipment as these: 1. Achieve maximum production. 2. Provide for economical repair and maintenance. 3. Build in safety.

He said to insure the safety of

test equipment one must anticipate potential dangers and then specify the safeguards necessary to prevent accidents from happening.

Safety Training

A. B. Barnes didn't wear his rose-colored glasses to the National Safety Congress. The theme of the Congress—"Safety in the Sixties," a look at what the coming decade will hold for man—"denotes a forward look, a confident attitude," observed Barnes, safety and fire prevention engineer, Fibreboard Paper Products Corp., Oakland, Calif.

"I'm going to leave the rosy glasses to others," he said. "Not that there isn't reason for confidence. There will be new ideas and new techniques to combat the old and new safety problems. But since people are people, our major problem still will be to guard people from themselves."

However, J. E. Monaghan doesn't agree you can't teach an old dog new tricks.

"Habits can be changed, influenced or corrected," he declared.

Monaghan, training consultant, Bemis Bro. Bag Co., St. Louis, Mo., was referring specifically to bad habits in industry and their relation to safety. "Bad habits," he said, "may be unconscious, and their repetition reinforces them. Desirable habits result from proper training." He said the "early eradication of undesirable habits" is "one of the fundamentals which I consider important" to safety.

The No. 1 injury-dealer to electricians isn't electricity—it's falls. So says Richard T. Wise, manager, maintenance service, B. F. Goodrich Footwear & Flooring Co., Watertown, Mass. "Far more electricians," he said, "are hurt in falls from ladders than from electric shock."

"It seems," he said, "that many injuries occur that are not directly connected with the hazards of the maintenance employees' jobs. From experience and instruction, the men seem aware of the dangers of their particular work. Apparently they relax during the preparatory and cleanup phases."

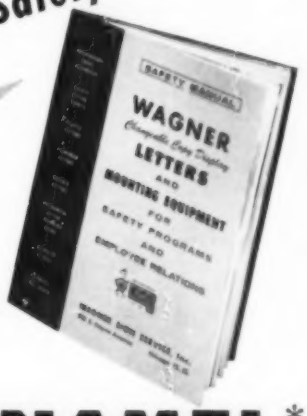
Safety, according to Sam O. Brookes, is like taxes. "It must be continually kept after and continually brought to the minds of people," he said.

Brookes, personnel director, J. P. Stevens & Co., South Boston, Va., said that new employees in his firm are given a card listing various safety instructions, which are read the worker by his supervisor, who then has the employee sign the card signifying he understands the rules and regulations.

Later, as a follow-up in behalf of safety, the card is brought to the worker again to review the safety instructions he agreed to observe.

(Continued on page 40)

Free! – Data File on Potent Safety Promotion



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Fixed Ladders

(from page 7)

spokesman explained. "If it should warp, the sleeve would tend to bind as a man climbed up and down the rail. For this reason, we require a channel with close dimensional tolerance."

This type of ladder safety device has proved so successful that the United States Department of Labor has included it in a traveling exhibit of safety innovations. The exhibit was on display in Washington, D. C., for a year, then toured South America, Central America, and the Near and Far East. More than 500,000 persons saw the exhibit before it went on permanent loan to the Mexican government in Mexico City.

In 1957 the safety device took its first venture behind the Iron Curtain when the U. S. Department of Commerce, Office of International Trade Fairs included it in a mine and industrial safety exhibit in the U. S. pavilion at the Poznan, Poland, trade fair. The inventor received a government citation at that time.

Birth of Idea

The idea for the safety device was born one blustery, freezing winter day in 1947 in an Oklahoma oil field. A worker climbing high up on an oil rig was edging his way up the ice-encrusted ladder. Suddenly the worker lost his footing on the ice and would have plunged a hundred feet or more to the frozen ground, had he not been fortunate enough to catch himself. But the incident was witnessed by a visiting real estate man who had formerly worked in oil fields.

As often happens, the near-disaster precipitated a desire to find a remedy that would prevent such a thing from happening again. The direct result of that one incident was the ladder safety device—plus one simple additional feature. For such snow-region installations as the one in Oklahoma, the inventor has also devised an electrical heater system that keeps the carrier rail free from ice at all times.

This has made it possible for the U. S. Air Force to use the safety device on the Dew Line radar towers, this country's first line of defense far north in the Arctic

Safety device for ladders on towers has notched carrier's rail, sleeve riding on rail and climber's web belt.

Circle, and on floating radar outposts like the "Texas Tower" off Boston Harbor, and other ice area installations.

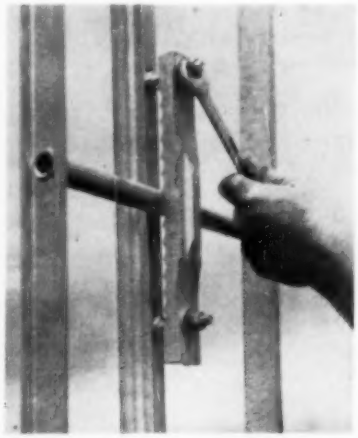
The original patented safety invention was developed in 1948. Production of the safety equipment began in 1950. That first year only four tons of steel were used. Today, and especially since 1954 when the idea actually caught on, some 250 tons of steel are required each year —and the end of the growth is obviously not in sight.

The safety devices for tower ladders are now found in Venezuela oil fields, Borneo drilling rigs, German oil derricks, Italian television towers, and in many uses by the Canadian government. And of course the equipment is found in a wide variety of American industries and Governmental agencies like the U. S. Air Force, Army, Navy, Coast Guard, Marine Corps, and Department of Agriculture.

The Port of New York Authority has installed the safety device in the Holland Tunnel; a brewing company has equipped its 28 malt bins with the device for cleaning inside the bins where a slip on the ladders could mean a sure-death fall into quicksand-like mash; and the Army Corps of Engineers uses the device in the slimy wells that extend into the bowels of government dams.

One of the most unusual uses of the safety device is the installation at film cowboy Roy Rogers' Sports Center in Chatsworth, California. The sports center's gun club claims the tallest "high tower field" in the world. Coupled with four combination skeet and trap fields, plus one extra trap and one extra skeet field, is the 96-foot high tower. Employees manning the high tower must scurry up and down it many times during the week.

Since the first installation on a 220-foot steel smoke stack for Texaco, Inc. in Port Arthur, Texas, the safety device has performed a quiet and efficient, yet untold, service to humanity. Every day it goes on saving the lives of men who must handle the high-climbing duties of industry—telephone men, oil field "roughnecks," soldiers on the Dew Line.



Closeup of method of installation on ladder is shown. Ladder rung clamp is tightened to back of carrier rail.

Pictures by courtesy of Bethlehem Steel Co. and Safety Tower Ladder Co.

Electric Connector Standards

Suggested minimum design standards for both aluminum and copper connectors are included in newly revised Electric Power Connector Standards (SG1-1959), announced by the National Electrical Manufacturers Association.

The standards also include recommended tightening torques for aluminum and bronze bolts. The up-dated standards are a major engineering development of the Electric Power Connector Group of the Switchgear Section. Copies at $1.80 each from the National Electrical Manufacturers Association, 155 East 44th Street, New York 17, N. Y.

Air & Water Pollution Control

Publication of the proceedings of the 1959 Air and Water Pollution Abatement Conference held March 18–19, 1959, in Cincinnati, is announced by the Manufacturing Chemists' Association, sponsor of the conference.

The eleven papers presented at the conference, including all pertinent charts, graphs and illustrations, are reproduced in the 161 page book. Introductory remarks by Harry B. McClure and a complete list of registrants is also included.

The following topics are covered: "Assimilative Capacity of Natural Streams" by D. J. O'Connor; "Choice of Process for Biological Oxidation of Industrial Waste" by V. T. Stack, Jr.; "Biological Oxidation of Organic Chemical Wastes in Stabilization Basins" by W. M. Steinfeldt and J. T. Garrett; "Interesting Side Lights on Sanitary Engineering Center's Research in Water Supply and Water Pollution" by B. B. Berger; "Cincinnati's Air Pollution Control Program" by C. W. Gruber; "The Odor Survey—A Tool for Air Pollution Control" by A. N. Heller, H. J. Kandiner, W. M. Reiter and M. Cohen; "Demisters for Sulfuric Acid Plant Stacks" by O. D. Massey; "Mist Collection with Fiber Beds" by J. A. Brink, Jr.; "The Development of the Fauna and Flora in a New Stream Bed, Progress Report" by R. Patrick; "Status of Air Pollution, Nationally" by G. P. Larson; and "Federal Activities in Air Pollution" by A. C. Stern.

Copies are available from Manufacturing Chemists' Association, Inc., 1825 Connecticut Avenue, N. W., Washington 9, D. C. at $2.00 each.

AEC Appoints Safety Assistant

General Manager A. R. Luedecke of the Atomic Energy Commission has established the Office of Assistant General Manager with responsibility for Commission activity in the fields of licensing and regulation, license compliance, health and safety and relations with state governments.

Appointed to the post of Assistant General Manager for Regulation and Safety is William F. Finan, currently Assistant Director for Management and Organization, Bureau of the Budget. He took over his new duties in December.

Mr. Finan is responsible for planning, coordinating and directing the activities of the Division of Licensing and Regulation and the Office of Health and Safety.

Nuclear Methods Test Insecticides

A radiotracer method for precise measurement of insecticide diffusion and absorption in food stuffs has been developed by Nuclear Science and Engineering Corp. Scientists at NSEC are analyzing the data from a recent project utilizing carbon-14 tagged insecticides, tested at an experimental farm. The tests are sensitive to one part of insecticide in ten million parts of milk. In the current tests it was desired to determine whether a substance employed in a commercial fly spray for use in dairy barns eventually appears in the milk from the exposed cows. Radioactive tracer techniques were chosen for this study since they provided greater sensitivity and specificity than other more conventional methods. The cows were exposed to the spray labeled with carbon-14 and the amount of radioactivity that appeared in the milk was determined.

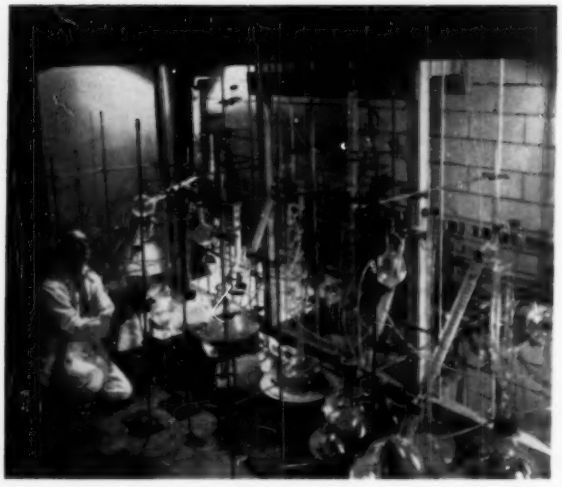
The background level in the milk was determined over a five-day control period prior to spraying with the tagged compound. These samples were counted in a liquid scintillation counter.

Following the five-day control period two cows were sprayed with the tagged product once daily for 10 days at NSEC farm facilities. Milk was collected on each day of the spray period as well as for 30 days following the end of the spray applications, and analyzed for carbon-14.

At the end of the milk sampling period the cows were slaughtered and portions of various tissues were radioassayed to determine possible concentration of the radioactive compound and its metabolites. The tissue samples were wet combusted and carbon-14 was counted as carbon dioxide in the ultra sensitive low-leved gas counters with a limit of detection of 10–20 dpm per 100 mg of tissue. Metabolic studies have been continued in an attempt to identify the products in the milk and tissue which were radioactive.

techniques of laboratory ventilation

What air velocity should be maintained at the face of lab exhaust hoods?
Where should exhaust hoods be located within the room?
Should fans be located on the hood or outside the building?
Is it safe to turn off one fan in multiple exhaust hoods?
What are the coming developments in dust and fume control?



by **JAMES C. BARRETT**
Occupational Health Division
Michigan State Dept. of Health
Lansing, Michigan

Today there is an increasing need for adequate ventilation in the laboratory. All around us are evidences of increased basic research, new methods of quality control, and the emphasis on science in our schools and universities.

In our laboratories, chemists are working with materials of various degrees of hazards and toxicity, and with our growing family of radioactive isotopes. Especially in the laboratory, the safety engineer must have a working knowledge and appreciation of fundamentals of ventilation and the things that ventilation can do to protect and safeguard the worker.

Hood Design

Good laboratory ventilation will confine the toxic contaminant and will exhaust it to the out-of-doors through suitable ductwork and fan, passing the material through a collector or scrubber as needed before release to the neighborhood. Consider a basic laboratory hood reduced to the bare fundamentals—a simple box. After confinement of the material in the box it may escape in any of three ways.

First, agitation from chemical or mechanical action may disperse the contaminant through the open doorway of the hood. Second, there may be thermal action from the chemical reaction or from the use of heating equipment to aid the reaction. Third, crosscurrents of air may be sufficient to syphon the air and contaminant out of the hood.

To overcome this tendency to escape, it is necessary to exhaust enough air to create an indraft through the face of the hood. **Ventilation control cannot be achieved without adequate air flow.**

Capture velocity has been a controversial subject in recent years, but it is not as confusing as it may seem. Since we must confine the material within the hood, there has to be a certain minimum velocity through the door. Certain velocities are recommended for laboratory bench-type hoods by the American Conference of Governmental Industrial Hygienists.

For chemical and moderate toxicity material the average face velocity should be a minimum of 100 feet per minute (fpm) through the open door area with an 80 fpm minimum at any point. **For high toxicity and radioactive** material this should be raised to an average of 125 to 200 fpm with an absolute minimum of 100 fpm.

There is no question that a minimum of 100 fpm face velocity is needed. At lower velocities the material and air in the hood will **follow** the chemist, as he moves about in front of the hood or leaves the hood to perform some other function in the laboratory.

These conclusions are substantiated by a group of engineers at the Los Alamos Scientific Laboratory performing work for the Atomic Energy Commission. They point out that velocities less than 100 fpm do not provide adequate control.

There are times when it may be practical to use lower velocities at the hood. Many chemical reactions progress over long periods, with the greatest danger coming when equipment is set up and before it is

DUST & FUME CONTROL SERIES
Other Articles in Dec. & Feb.

completely sealed. After setup, the apparatus may be left without direct supervision. Under these conditions, with a favorable location of the hood in the room, it is possible to reduce face velocities, since there are no operating personnel to disturb conditions at the face of the hood.

Many companies have found that two-speed fan control is entirely satisfactory in these cases. For the low-volume operations, face velocities of 75 to 80 fpm have been used successfully. When the exhaust volume is reduced, the doors of the hood are partially or completely closed as an additional safeguard.

It must be emphasized that this can be accomplished only under ideal conditions with a minimum of disturbance at the face of the hood and with a minimum of agitation or chemical reaction inside the hood. Either of these conditions will require the use of higher velocity to maintain ventilation control.

Glove Box Hood

Another common type of laboratory hood used for work with radioisotopes, tuberculosis germs and in many standard chemical laboratories is the glove box hood. Here, the chemist is entirely outside of the hood, and his only contact with the interior is through the glove ports.

This hood has actually been called a laboratory in itself, since it is usually equipped with water, gas, vacuum, lights and any other facilities needed. In some instances the hood is maintained with an atmosphere of inert gases for special purposes. When using radioisotopes or neutral atmospheres in the hood, it is necessary to provide airlocks, so apparatus or materials may enter and leave the hood without exposing the hood contents to the room.

The exhaust volumes for this hood are based on maintaining a 50 fpm in velocity draft at any opening; usually this means an exhaust of 20 to 30 cfm of air for each glove box. In many designs, filters are used in the exterior of the box in portions of the airlock doors to provide for clean entering air. If such filters are used, they should be located at the back or sides of the glove box so as not to expose the chemist's body in a puff-back or explosion of any materials in the hood.

For radioactive materials where it is important to keep the ductwork clean, pre-filters can be mounted at the duct inlet with provision for a cleanup or absolute filter in the exhaust branch. In other designs the pre-filter is incorporated in the same enclosure with the absolute filter, so when these become loaded too heavily, they may be discarded as a unit, requiring less handling of the contaminated filter material.

Hood Location

The location of the exhaust hood in the room is most important. In one example, typical of many poor hood locations, there may be no means of supplying air to the laboratory except through the open doorway, and the hood is in the direct path of the incoming air stream. Cross draft velocities will be in the range of 40 to 50 fpm across the hood face. We cannot expect the air will turn directly and go into the hood, as so many trained arrows like to indicate.

A more favorable hood location is where the distance between the hood and the doorway is such that the supply air will lose velocity before coming within the influence of the hood.

A very simple hood can do a satisfactory job; but in a poor location—such as near the doorway, exhaust velocities must be higher than the average to overcome crossdrafts.

In a simple hood constructed largely of glass and stainless steel, the hood located well away from the doorway through which the air must enter can perform satisfactorily at average face velocities.

Good laboratory ventilation provides that the ductwork inside the building will be under negative pressure; thus, any leakage due to poor construction or general depreciation of the ductwork will be into the ducts, confining the contaminant.

The most convenient location for the fan, on top of the hood, is generally the wrong one. While a fan on the roof or on the building wall requires weatherproofing for the motor, it is still the preferred location.

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In use of flammable materials there is a distinct advantage in mounting the fan outside the laboratory, since explosion-proof construction may not be required for the motor. Also, in cases of motor failure, replacements can be obtained rapidly and economically.

The same principal holds true for large involved systems of ductwork with more than one hood connected to the exhaust system. All ductwork inside the building should be under negative pressure to prevent leakage of materials. In these systems duct connections should be streamlined, with branch ducts entering at angles of 30 to 45 degrees, instead of the straight-T connections we see so often.

In handling the ventilation air at high velocities, streamlined connections are important. Ductwork must be sized to maintain minimum transport velocities, whenever particulate matter is being carried. Otherwise, settling of material will occur in sections where the duct is too large.

The usual range of transport velocities is 3,500 to 4,500 fpm. In hoods intended to remove only fumes, gases, or vapors, the duct velocity may be reduced to any practical figure; the usual choice is about 2,000 fpm, since it offers a good compromise between horsepower servings and the space required by large ductwork.

In recent years there has been rapid improvement in the field of corrosion protection for ventilation systems. We see applications ranging from transite pipe of stainless steel alloys, metals coated with polyvinyl chloride and recently applications of fibrous glass-reinforced plastic ductwork. Each of these materials has its own special application, but there usually is considerable overlapping.

Proper Installation Vital

The fan for the system should always be located outside the building. An often-overlooked point is that the fan should be installed properly to achieve its rated performance. One typical duct connection uses an elbow directly at the fan inlet; usually the only excuse for this is that it is convenient, since this elbow will reduce fan performance.

Usually laboratory fume hoods are not provided with collectors or scrubbers to remove the contaminant from the air before it is released to the atmosphere. Preferably the discharge should be a minimum of 5 to 10 ft. above the laboratory roof.

This cannot be applied as a rule, since the proximity of other buildings or the existence of peculiar wind currents will affect the ultimate paths of the exhausted air. Generally, the exhaust should not be so located that fumes are redirected to the laboratory roof or in such a position that prevailing winds may carry fumes into the building at another point.

Illustrating a poor fan installation, a straight T is sometimes used as weather protection. The exhaust is directed back down to the roof and may be carried over the roof and into the laboratory windows on the lee side of the building. Also, in terms of fan efficiency, this is a very poor discharge arrangement.

In a typical inverted cone type of weather cap, obsolete for years, the cap not only imposes additional resistance on the system, but also reverses the flow

of the exhausted fumes towards the roof. The fumes may be trapped by a parapet and may re-enter the building at any convenient point.

The most practical fan discharge is the straight vertical stack with no directional baffles or projections. A fume released vertically will travel upwards considerable distances before being subjected to atmospheric conditions. A common type of stack head offering weather protection is the so-called butterfly type of damper.

The variety of corrosive and toxic materials handled in the laboratory hood, plus the varying demands of air cleanliness, are such that use of collection equipment is a highly specialized problem, and each particular case must be handled separately. Generalization is dangerous. However, proper engineering attention must be given to the over-all problem of eliminating toxic and nuisance fumes from the atmosphere in which we live.

Air Supply

The supply of air in any room or building is not infinite. Since the air from the laboratory is exhausted outdoors, the supply of air must come from outside, whether directly to the laboratory or indirectly through he offices and adjacent areas.

In exhausting, a fan creates a pressure below atmospheric, a so-called **negative pressure,** causing air to flow into the hood and ductwork. Replacement air is attracted to the negative pressure area at the inlet to the exhaust system, which in the typical small laboratory is the room itself.

Without provision for air supply there will be an inward leakage of air through the outside windows, doors, and in extreme cases through any other exhaust equipment in the room. Experience has shown that where there are two fans exhausting from the same space with no provision for make-up air, **the stronger fan will overcome the weaker, and air will actually enter the room against the weaker fan.**

In multiple exhaust hoods, when one hood is turned off, the results can be disastrous, since outside air will immediately downdraft through the fan not in operation. When a fan must exhaust out of the room without air supply, the capacity of the fan will be reduced from the original design volume, and there may be less control at the hood.

Only Satisfactory System

The only satisfactory ventilation system is one providing for exhaust of contaminated air and the replacement of the air with controlled air supply. This may be done on an individual laboratory basis, or an air supply system can be designed to satisfy the general ventilation requirements of the entire building, as well as the laboratory. In a central air supply system, the main supply duct is carried in unused space above the corridor ceiling, and the air supply is split. A portion of the air goes directly to the laboratory, where it is under the control of the exhaust fan at the hood.

This air volume is less than the exhaust air requirements of the laboratory; the balance of the exhausted air enters the laboratory from the corridor through

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suitable grill work. The corridor obtains its air supply from the adjacent offices, which receive a portion from the main supply system and are provided with returns to allow this air to pass through the corridor

In practice the offices are under a slight positive pressure; the corridor is under less pressure; and the laboratory is under a slight negative pressure with respect to the corridor and offices. In the event of exhaust fan failure or a reduction in volume due to belt wear, fan corrosion, etc., a sensitive control in connection with a metering orifice in the exhaust system will close the direct air supply to the laboratory. The only air which the laboratory can obtain must come from the corridor, minimizing any possibility of leakage to other areas of the building.

Future Problems

In recent years there have been a number of radical designs proposed for laboratory hoods; these include so-called "low-velocity air-foil" hoods and "air supply hoods." In practice these designs reduce the heating and ventilating load, because they operate at lower exhaust volume; but unfortunately the consensus is they are not effective in providing control.

Basically, the air-foil hood design is good, since we know that with a more streamlined hood entry the better the flow characteristics will be. Face velocity must overcome both the tendency for the material to leave the hood under its own power and the cross-drafts at the face of the hood. Experience shows a minimum of 100 fpm average velocity is required to give adequate face control. The use of air foils will be beneficial, but they cannot be used to reduce the face velocity.

In so-called air supply hoods, the one design which has attracted a great deal of attention involves the use of air supply slots or grills at the face of the hood to blow a curtain of air across the opening; in most cases this air is taken directly from outdoors.

There are three principal objections we have found to the use of the hood with the built-in air supply:

1. There will be excessive turbulence at the face of the hood.

2. During the hood's life, the various corrosive materials used in the hood will have a serious effect on the exhaust fan. Unless this fan is given careful maintenance, it will lose efficiency and exhaust lower volumes of air.

At the same time, the supply fan is handling relatively clean air and will provide almost a constant volume. The result is a steady decrease in face velocity.

3. Under many conditions of winter use, the cold supply air will cause condensation in the hood resulting in serious problems. It is always possible to turn the supply air off in the winter time, but this defeats the purpose of the entire installation.

In future laboratory ventilation, we expect to find more materials of very high toxicity or of suspected high toxicity, as fundamental research programs continue to expand. We may also find that increasing numbers of radioisotopes are used in all of our laboratories.

As we handle more dangerous materials, we will be called on to provide additional ventilation in the laboratory, and the problems of air conservation will become quite critical.

One firm has used local exhaust ventilation to provide **spot** control with a small volume of air. A small hood, moving on nylon rollers, exhausts 270 cfm, which is sufficient to control benzene vapors released. The nylon rollers and a bonding wire used in the nonmetallic flexible ductwork are included as fire safety protection. With this type of ventilation, engineers avoided the installation of a large bench type of hood which would have required many times more exhaust.

In another application a form of local or spot exhaust ventilation is again used. Many apparatus can be set up safely in the laboratory room requiring exhaust at only one or two points. This can be done successfully with short drops of flexible duct, with provision for positioning these to give the necessary ventilation control.

Additional technique provides the standard bench hood with a horizontal sliding sash instead of a vertical sliding one. In this way the hood can be large enough to give sufficient working space; yet the open area at the face of the hood is reduced in half.

The use of the glove box should increase in the laboratory. It has the advantage of being small, occupying little space. It can be built to offer suitable protection for explosive gases and can be airtight to permit the use of special atmospheres. It is well suited for work with radioisotopes and bacteria.

The small size of the glove box makes it possible to move the entire box to a central decontamination station. In one decontamination station, large enclosing hoods are used. The individual glove box is placed in the decontamination hoods, and all operations are carried on through glove ports in the outer hood.

We have also observed the use of a hood similar to a glove box on an ordinary production arc-welding job. With this installation the normal glass front was replaced with tinted welding safety glass, and instead of glove ports the hood had a slot at the bottom through which the operator's arms could project. The principle was the same, and good control was afforded with a minimum amount of exhaust air.

Successful ventilation of any process depends on close cooperation of all persons involved, including the chemist, the safety engineer and the design engineer. In improving our techniques of ventilation we should be able to make rapid progress in the laboratory, since we are dealing with highly trained professional people who have shown themselves able and willing to absorb new techniques.

Local or spot ventilation will not work, if it does not recognize the nature of the contaminant and the way it is dispersed, and if it is not used by the chemist. Similarly, the glove box technique will not be effective unless the chemist is willing to accept minor inconveniences in his work to obtain the benefits of the additional safety that can be provided. If he wants to work in an air-conditioned laboratory, he must be willing to accept responsibility in helping to plan and use the ventilation provided for him.

From an address presented at the 46th National Safety Congress. Pictures by courtesy of Eastman Kodak and Fisher Scientific Co.

THE SAFETY LIMITS OF HAZARDOUS MATERIALS

Latest Maximum Allowable Concentrations

The following tables present the Threshold Limit Values for various harmful substances adopted at the Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 25–28, 1959. The limit values should be used as guides to control industrial health hazards, but have no application in the field of community air pollution. The values should not be considered as fine dividing lines between safe and dangerous concentrations. They represent exposures for repeated normal work-days. The degree to which the limit values may be exceeded for short periods depends on several factors such as: toxicity of the contaminant, cumulative effects, frequency of high concentrations, duration, combination with other dangerous substances.

Recommended Values Gases and Vapors

SUBSTANCE	PPM*	Approx. Mg. per Cu. M.†
Acetaldehyde	200	360
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,400
Acetylene tetrabromide	1	14
Acrolein	0.5	1.2
Acrylonitrile	20	45
Allyl alcohol	5	12
Allyl chloride	5	15
Allyl propyl disulfide	2	12
Ammonia	100	70
Amyl acetate	200	1,050
Amyl alcohol (isoamyl alcohol)	100	360
Aniline	5	19
Arsine	0.05	0.2
Benzene (benzol)	25	80
Benzyl chloride	1	5
‡Bromine	0.1	0.7
Butadiene (1,3-butadiene)	1,000	2,200
Butanone (methyl ethyl ketone)	250	740
Butyl acetate (n-butyl acetate)	200	950
Butyl alcohol (n-butanol)	100	300
Butylamine	5	15
Butyl cellosolve (2-butoxyethanol)	50	240
Carbon dioxide	5,000	9,000
Carbon disulfide	20	60
Carbon monoxide	100	110
Carbon tetrachloride	25	160
Cellosolve (2-ethoxyethanol)	200	740
Cellosolve acetate (2-ethoxyethyl acetate)	100	540
Chlorine	1	3
Chlorine trifluoride	0.1	0.4
Chlorobenzene (monochlorobenzene)	75	350
‡Chloroform (trichloromethane)	50	240
l-Chloro-l-nitropropane	20	100
‡Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1,3-butadiene)	25	90
Cyclohexane	400	1,400
Cyclohexanol	100	410
Cyclohexanone	100	400
Cyclohexene	400	1,350
Cyclopropane	400	690
Decaborane	0.05	0.3
Diacetone alcohol (4-hydroxy-4-methyl 2-pentanone)	50	240
Diborane	0.1	0.1
o-Dichlorobenzene	50	300
Dichlorodifluoromethane	1,000	4,950
1, 1 Dichloroethane	100	400
1, 2-Dichloroethane (ethylene dichloride)	100	400
1, 2-Dichloroethylene	200	790
Dichloroethyl ether	15	90
Dichloromonofluoromethane	1,000	4,200
1, 1-Dichloro-1-nitroethane	10	60
Dichlorotetrafluoroethane	1,000	7,000
Diethylamine	25	75
Difluorodibromomethane	100	860
Diisobutyl ketone	50	290
Dimethylaniline (N-dimethylaniline)	5	25
Dimethylsulfate	1	5
Dioxane (diethylene dioxide)	100	360
Ethyl acetate	400	1,400
Ethyl acrylate	25	100
Ethyl alcohol (ethanol)	1,000	1,900
Ethylamine	25	45
Ethylbenzene	200	870
Ethyl bromide	200	890
Ethyl chloride	1,000	2,600
Ethyl ether	400	1,200
Ethyl formate	100	300
Ethyl silicate	100	850
Ethylene chlorohydrin	5	16
Ethylenediamine	10	30
Ethylene dibromide (1, 2-dibromoethane)	25	190
Ethylene imine	5	9
Ethylene oxide	50	90
Fluorine	0.1	0.2
Fluorotrichloromethane	1,000	5,600
Formaldehyde	5	6
Furfural	5	20
Gasoline	500	2,000
Heptane (n-heptane)	500	2,000
Hexane (n-hexane)	500	1,800
Hexanone (methyl butyl ketone)	100	410
Hydrazine	1	1.3
Hydrogen bromide	5	17
Hydrogen chloride	5	7
Hydrogen cyanide	10	11
Hydrogen fluoride	3	2
Hydrogen peroxide, 90%	1	1.4
Hydrogen selenide	0.05	0.2
Hydrogen sulfide	20	30
Iodine	0.1	1
Isophorone	25	140
Isopropylamine	5	12
Mesityl oxide	25	100
Methyl acetate	200	610
Methyl acetylene	1,000	1,650
Methyl acrylate	10	35
Methyl alcohol (methanol)	200	260
Methyl bromide	20	80
Methyl cellosolve (2-methoxyethanol)	25	80
Methyl cellosolve acetate (ethylene glycol monomethyl ether acetate)	25	120
Methyl chloride	100	210
Methylal (dimethoxymethane)	1,000	3,100
Methyl chloroform (1,1, 1-trichloroethane)	500	2,700
Methylcyclohexane	500	2,000
Methylcyclohexanol	100	470
Methylcyclohexanone	100	460
Methyl formate	100	250
Methyl isobutyl carbinol (methyl amyl alcohol)	25	100
α-Methyl styrene	100	480
Methylene chloride (dichloromethane)	500	1,750
Monomethyl aniline	2	9
Naphtha (coal tar)	200	800
Naphtha (petroleum)	500	2,000
Nickel carbonyl	0.001	0.007
Nitric acid	10	25

p-Nitroaniline	1	6
Nitrobenzene	1	5
Nitroethane	100	310
Nitrogen dioxide	5	9
Nitroglycerin	0.5	5
Nitromethane	100	250
2-Nitropropane	50	180
Nitrotoluene	5	30
Octane	500	2,350
Ozone	0.1	0.2
Paradichlorobenzene	75	450
Pentane	1,000	2,950
Pentanone (methyl propyl ketone)	200	700
Perchlorethylene (tetrachloroethylene)	200	1,350
Phenol	5	19
Phenylhydrazine	5	22
Phosgene (carbonyl chloride)	1	4
Phosphine	0.05	0.07
Phosphorus trichloride	0.5	3
Propyl acetate	200	840
Propyl alcohol (isopropyl alcohol)	400	980
Propyl ether (isopropyl ether)	500	2,100
Propylene dichloride (1, 2-dichloropropane)	75	350
Propylene imine	25	60
Propylene oxide	100	240
Pyridine	10	30
Quinone	0.1	0.4
Stibine	0.1	0.5
Stoddard solvent	500	2,900
Styrene monomer (phenylethylene)	100	420
Sulphur dioxide	5	13
Sulphur hexafluoride	1,000	6,000
Sulphur monochloride	1	6
Sulphur pentafluoride	0.025	0.25
Tertiary butyl alcohol	100	300
p-Tertiary butyltoluene	10	60
1, 1, 2, 2-Tetrachloroethane	5	35
Tetrahydrofuran	200	590
Tetranitromethane	1	8
Toluene (toluol)	200	750
o-Toluidine	5	22
Tolylene-2, 4-diisocyanate	0.1	0.7
Trichloroethylene	200	1,050
Triethylamine	25	100
Trifluoromonobromomethane	1,000	6,100
Turpentine	100	560
Vinyl chloride (chloroethylene)	500	1,300
Vinyl toluene	100	480
Xylene (xylol)	200	870
Xylidine	5	25

xParts of vapor or gas per million parts of air by volume.
†Approximate milligrams per cubic meter of air.
‡Change in value previously listed.

Toxic Dusts, Fumes, and Mists

SUBSTANCE	Mg. per Cu. M.§
Aldrin (1, 2, 3, 4, 10, 10-hexachloro-1, 4, 4a, 5, 8, 8a-hexahydro-1, 4, 5, 8-dimethanonaphthalene)	0.25
Ammate (ammonium sulfamate)	15
Antimony	0.5
ANTU (alpha-naphthyl-thiourea)	0.3
Arsenic	0.5
Barium (soluble compounds)	0.5
Beryllium	2‡γ/m³
Cadmium oxide fume	0.1
Calcium arsenate	0.1
Chlordane (1, 2, 4, 5, 6, 7, 8, 8-octachloro-3a, 4, 7, 7a-tetrahydro-4, 7-methanoindane)	2
Chlorinated camphene, 60%	0.5
Chlorinated diphenyl oxide	0.5
Chlorodiphenyl (42% chlorine)	.1
Chlorodiphenyl (54% chlorine)	0.5
Chromic acid and chromates (as CrO_3)	0.1
Crag herbicide (sodium 2-[2, 4-dichlorophenoxy] ethanol hydrogen sulfate)	15
Cyanide (as CN)	5
2, 4-D (2, 4-dichlorophenoxyacetic acid)	10
DDT (2, 2-bis [p-chlorophenyl]-1, 1, 1-trichloroethane)	1
Dieldrin (1, 2, 3, 4, 10, 10-hexachloro-6, 7-epoxy-1, 4, 4a, 5, 6, 7, 8, 8a-octahydro-1, 4, 5, 8-dimethano-naphthalene)	0.25
Dinitrobenzene	1.
Dinitrotoluene	1.5
Dinitro-o-cresol	0.2
EPN (O-ethyl O-p-nitrophenyl thionobenzenephosphonate)	0.5
Ferbam (ferric dimethyl dithiocarbamate)	15
Ferrovanadium dust	1
Fluoride	2.5
Hydroquinone	2
Iron oxide fume	15
Lead	0.2
Lead arsenate	0.15
Lindane (hexachlorocyclohexane, gamma isomer)	0.5
Magnesium oxide fume	15
Malathion (O,O-dimethyl dithiophosphate of diethyl mercaptosuccinate)	15
Manganese	6
Mercury	0.1
Mercury (organic compounds)	0.01
Methoxychlor (2, 2-di-p-methoxyphenyl-1, 1, 1, 1-trichloroethane)	15
Molybdenum	
(soluble compounds)	5
(insoluble compounds)	15
Nicotine	0.5
Parathion (O, O-diethyl-O-p-nitrophenyl thiophosphate)	0.1
Pentachloronaphthalene	0.5
Pentachlorophenol	0.5
Phosphorus (yellow)	0.1
Phosphorus pentachloride	1
Phosphorus pentasulfide	1
Picric acid	0.1
Pyrethrum	2
Rotenone	5
Selenium compounds (as Se)	0.1
Sodium fluoroacetate (1080)	0.1
Sodium hydroxide	2
Strychnine	0.15
Sulfuric acid	1
TEDP (tetraethyl dithionopyrophosphate)	0.2
TEPP (tetraethyl pyrophosphate)	0.05
Tellurium	0.1
Tetryl (2, 4, 6-trinitrophenylmethylnitramine)	1.5
Thallium (soluble compounds)	0.1
Thiram (tetramethyl thiuram disulfide)	5
Titanium dioxide	15
Trichloronaphthalene	5
Trinitrotoluene	1.5
Uranium	
(soluble compounds)	0.05
(insoluble compounds)	0.25
Vanadium	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Warfarin (3-[α-acetonylbenzyl]-4-hydroxycoumarin)	0.5
Zinc oxide fumes	15
Zirconium compounds (as Zr)	5

Radioactivity: For permissible concentrations of radioisotopes in air, see "Maximum Permissible Amounts of Radioisotopes in the Human Body and Maximum Permissible Concentrations in Air and Water," Handbook 52, U.S. Department of Commerce, National Bureau of Standards, March, 1953. In addition, see "Permissible Dose from External Sources of Ionizing Radiation," Handbook 59, U.S. Department of Commerce, National Bureau of Standards, Sept. 24, 1954.

U.S. Department of Commerce Handbook 52 has been superseded by Handbook 69, "Maximum Permissible Body Burdens and Maximum Permissible Concentrations of Radionuclides in Air and in Water for Occupational Exposure," subsequent to the presentation of this report.

Handbook 59, U.S. Department of Commerce, has been revised by addition of addendum, April 15, 1958.

§ Milligrams of dust, fume, or mist per cubic meter of air.

Mineral Dusts

SUBSTANCE	MPPCF‖
Aluminum oxide	50
Asbestos	5
Dust (nuisance, no free silica)	50
Mica (below 5% free silica)	20
Portland cement	50
Talc	20
Silica	
high (above 50% free SiO_2)	5
medium (5 to 50% free SiO_2)	20
low (below 5% free SiO_2)	50
Silicon carbide	50
Soapstone (below 5% free SiO_2)	20

‖ Millions of particles per cubic foot of air.

TENTATIVE VALUES

SUBSTANCE	PPM¶	Aprox. Mg. Per Cu. M.#
Allyl glycidyl ether (AGE)	10	45
Boron trifluoride	1	3
n-Butyl glycidyl ether (BGE)	50	270
Butyl mercaptan	10	35
Chlorine dioxide	0.1	0.3
Chloroacetaldehyde	1	3
Chlorobromomethane (ClBrCH2)	400	2,100
Diglycidyl ether (DGE)	10	55
Dimethyl formamide	20	60
1,1-Dimethyl hydrazine	0.5	1
Dipropylene-glycolmethylether	100	600
Ethyl mercaptan	250	640
Furfuryl alcohol	50	200
Glycidol	50	150
sec-Hexyl acetate	100	590
Isopropyl glycidyl ether (IGE)	50	240
Lithium hydride		25γ/m³
Methyl mercaptan	50	100
Perchloromethyl mercaptan	0.1	0.8
Phenyl glycidyl ether (PGE)	50	310
Phosphoric acid		1
n-Propyl nitrate	25	110
1,2,3-Trichloropropane	50	300
Triorthocresyl phosphate		0.1
Yttrium & inorganic compounds		5
Teflon decomposition products	*	*
Pentaborane (B.H.)	*	*

¶ *Parts of vapor or gas per million parts of air by volume.*

\# *Approximate milligrams per cubit meter of air.*

* *Until more data are forthcoming, it is important that atmospheric concentrations of these materials to which workers are exposed must be kept as near 0 as possible.*

Unloading Carbolic Acid

Recommended safe practices for unloading liquid phenol (carbolic acid) from tank cars are detailed in a revised edition of Manual Sheet TC-6 just published by the Manufacturing Chemists' Association, Inc. The 10-page publication lists authorized tank cars in common use for the transportation of this toxic, combustible chemical listed by ICC as a Class B poison. It gives new information on types of tank cars which must be used and on the types of dome fittings with which they must be equipped.

Introductory sections deal with hazards, protective equipment, first-aid and safety precautions. Sections follow on the preparation of the tank car for unloading. These sections cover car placement, dome fittings, venting, steaming or melting of the crystalline material and sampling.

The booklet gives detailed instructions for unloading the car by pump and by use of air pressure. Easily understood drawings showing unloading connections are included. Unloading from the bottom outlet is not recommended. Present safety information for piping phenol from the unloading point to the storage tank, possible unloading difficulties involving gaskets, eduction or syphon pipes and heater coils, and advice for the return of empty tank cars also is included.

The revised edition of TC-6, "Unloading Phenol from Tank Cars," is published as an activity of MCA's Committee on Tank Cars, Tank Trucks and Portable Tanks. Copies are available from the Manufacturing Chemists' Association, Inc., 1825 Connecticut Avenue, N. W., Washington 9, D. C., at 30 cents each.

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The Safety Shelf

Flash Point Index

A standard reference work for all who deal with flammable and combustible liquids has just been issued in a new and revised edition by the National Fire Protection Association. "Flash Point Index of Trade Name Liquids" lists more than 4500 products in its 1959 issue. Data given includes the flash point of the liquid, the name of the manufacturer, principal use of the product, and the source of the information listed.

The new edition supersedes one published in 1957 under the title of "Trade Name Index of Flammable Liquids." Copies of the index (NFPA No. 325A, 160 pages, $.50 per copy) are available from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Mass.

LP Gas Storage, Handling

A new edition of the standard for the fire-safe storage and handling of liquefied petroleum gases has been issued by the National Fire Protection Association. This standard is widely used as a guide and forms the basis of laws or regulations applied with the force of law in some 45 states and General Canadian provinces.

Twelve changes from previous issues of the standard are incorporated in the 1959 edition. One important revision is provision for the use of interchangeable containers for above or below ground installations. Acceptance of vapor-actuated LP-Gas transfer pumps under specified operating conditions is provided for, and fuse plugs are eliminated as part of the regular relief discharge requirements of containers except as supplementary devices. A number of other changes clarify existing provisions of the standard.

The new edition of the standard was developed by the NFPA Sectional Committee on Liquefied Petroleum Gas, under the chairmanship of Harold L. DeCamp of the Fire Insurance Rating Organization of New Jersey, and accepted at the recent NFPA annual meeting. Copies of the standard (NFPA No. 58, 80 pages, 50¢ per copy) may be obtained from the National Fire Protection Association 60 Batterymarch Street, Boston 10, Mass.

Castings Buyers Guide

The first comprehensive Buyers Directory dealing exclusively with the purchasing needs of America's 6085 metal castings producers has just been published by the American Foundrymen's Society, Des Plaines, Ill., the international technical society for the cast metals industry. Developed over a period of three years, the directory classifies all major sources of supply for the nearly 2½ billion dollars spent annually by the industry for materials, equipment, supplies and special services.

"Rapid developments in new methods, mechanization and metallurgical developments in the castings field have made this new purchasing tool essential," according to Wm. W. Maloney, the society's general manager. "In the past 15 years the foundry industry has been virtually revolutionized, abruptly transformed from an industry of tradesman arts and personal skills to absolute dependence on the sciences of engineering, chemistry, physics and metallurgy.

"The society's Buyers Directory," he stated, "was developed because of the specialized methods, products and nomenclature of cast metals. Until now there has been no adequate listing of supply sources for this great basic industry whose cast products are valued at six billion dollars annually."

First edition of the new reference book contains over 300 pages and classifies over 1000 products available from over 1600 major supplier firms, and their local and regional sales representatives, dealers, jobbers and agents. The book, which will be issued every two years, also identifies nearly 3300 trade names of products. A special section, not usually available, locates 41 foundry supply houses and the myriad products they warehouse for immediate availability.

Another feature of the directory describes the many activities of the 12 major associations serving the castings industry as members of the National Castings Council, organized in 1946.

Copies of the AFS directory are being distributed to every cast metals plant in the United States and Canada, to schools and colleges teaching foundry and pattern-making courses, to U. S. Military establishments and to over 100 U. S. foreign service posts in countries with important manufacturing facilities. It is expected that the book, available to anyone interested at $10.00 list, will soon be in use by foundries throughout the world. Orders should be sent to: American Foundrymen's Society, Golf and Wolf Roads, Des Plaines, Ill.

Pressure Piping Code

The latest edition of American Standard Code for Gas Transmission and Distribution Piping Systems, ASA B31.8–1958, has been approved by the American Standards Association and published by the American Society of Mechanical Engineers.

The new edition brings the code up-to-date, incorporating many of the rulings that had been made

in the form of cases since 1955, when the first edition of this standard in its enlarged scope was published. Numerous revisions have also been made to clarify certain sections and to provide uniform interpretation and usage.

This code is Section 8 of the American Standard Code for Pressure Piping, which is directed by ASA sectional committee B-31. This committee, sponsored by ASME, has established an orderly procedure for revision of the code through the issuance of "cases." These are the committee's replies to requests it has received for interpretation.

Section 8 covers minimum requirements for the design, fabrication, installation, inspection, testing, and for the safe operation and maintenance of gas transmission and distribution systems, including gas pipelines, gas compressor stations, gas metering and regulating stations, gas mains, and gas services up to the outlet of the customer's meter.

Piping Systems

The Code for Pressure Piping deals primarily with engineering requirements for safe design and construction of piping systems. The committee points out that it is not a design handbook, but that it does contain basic reference data and formulas necessary for design.

While the work on the American Standard Code for Pressure Piping dates back to 1926, Section 8 was not published separately until 1952. The purpose was to provide an integrated document for gas transmission and distribution piping that would not require cross-referencing to other sections of the code. A new subcommittee was organized in 1952 to amplify Section 8 as new materials and methods of construction and operation made it necessary.

In 1955 the subcommittee revised the 1952 edition and considerably expanded its scope. Further experience in the application of the code resulted in revisions which the subcommittee incorporated in the new edition just published.

Mr. F. S. G. Williams, general chairman of the ASA B31 committee, said in announcing the new edition that the American Gas Association was responsible for substantial support and staff assistance to the Section 8 subcommittee.

Much of the subcommittee's work is based on research conducted by the American Gas Association and the ASME Pressure Vessel Research Committee. Chairman of the subcommittee is John H. Carson, vice president of The East Ohio Gas Company, Cleveland. The subcommittee has a membership of approximately 70 engineers drawn from design, engineering, construction, operation and testing, and also includes several nationally recognized technical consultants.

Copies of American Standard Code for Gas Transmission and Distribution Piping Systems, ASA B31.8–1958, are available at $2.50 a copy from American Standards Association, 70 East 45th Street, New York 17, New York.

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Commercial Standards

A new list of Commercial Standards revised to July 1, 1959 is now available, according to Commodity Standards Division, Office of Technical Services, U. S. Department of Commerce. The new index lists all Commercial Standards under 22 classifications including Apparel and Apparel Sizing; Chemicals; Electrical and Mechanical Equipment; Hardware; Instruments and Tools; Heating, Ventilating and Refrigeration; Household and Hospital Supplies; Lumber and Wood Products; Millwork; Paper and Petroleum Products; Plastics; Plumbing Materials and Fixtures; Pipe and Fitting; Precious Metals; Rubber Products; Textiles; and Thermal Insulation Materials.

New standards in preparation, and existing standards being revised to reflect current industry practices are shown in a supplemental list.

Commercial Standards are voluntary standards adopted by industry to establish nationally recognized quality requirements, including methods of testing, rating, or grading. They also provide a means for certifying and labeling products that comply. They are developed at the request of the industry concerned to form a common basis of understanding among producers, distributors, and users of the products, and to provide a basis for fair competition.

Single copies are available without charge upon request to the Commodity Standards Division, U. S. Department of Commerce, Washington 25, D. C. Ask for Catalog No. 978.

AEC Publishes Nuclear Review

The Atomic Energy Commission has published a 66-page booklet, "Research and Development in Reactor Safety" which describes the work being done in the Commission's reactor safety program. It is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at $0.65 a copy.

The booklet is a review of the current status of the Commission's research and development specifically directed toward making nuclear reactors safe for use in electric power generation, propulsion, and research. The essential features of the Commission's reactor safety research program are presented for the first time in one compact reference booklet. Major projects, both experimental and theoretical, are described and results obtained thus far are summarized. Primarily intended for reactor design specialists, nuclear engineers, technical administrators, students, and others interested in reactor developments, the booklet is extensively referenced and illustrated with diagrams, charts, and photographs.

Four generalized topic areas are included in the text. The first area covers kinetics and control, the SPERI series of experiments, KEWB experiments, the EBR-1 fast reactor experiments, and reactor safety devices, such as fuses. The second topical area includes potential reactions, fission product release, metal-water reactions, and metal-gas reactions. The third area concerns containment, primary reactor containment, secondary reactor containment, missiles, and earthquake studies. The fourth section is a bibliography.

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Sawmill Injuries

This report "Work Injuries and Injury Rates in Sawmills and Planing Mills," contains a detailed analysis of the frequency, severity, and kinds of injuries experienced in sawmills and planing mills. Included in the report are analyses of: 1. Injury rates by a. Establishment size, b. Geographic areas and States, c. Operating departments; 2. Nature of injuries and parts of body affected.

This Report (No. 146) may be obtained free of charge by directing your request to the Bureau of Labor Statistics, U. S. Department of Labor, Washington 25, D. C.

The S. G. Taylor Chain Supply Company, Inc., of Hammond, Indiana, has won its second consecutive safety award from the National Safety Council. The first place award, in the Heavy Fabricating Division of the Metal Section, represents 416,910 man hours—July 1, 1958 through June 30, 1959 without a disabling accident.

• • •

At the Department of the Army Quarterly Review and Analysis of Transportation Program Execution conference, Major General Frank S. Besson, Jr., Chief of Transportation, Department of the Army, presented Maj. Gen. N. H. Vissering, Commanding General, Fort Eustis, Va., with the Transportation Corps' "Award of Honor" for safety.

The Transportation Training Command statistical record for FY 1959 indicates the following reductions over the FY 1958 accident and injury rates: Army Motor Vehicle Accidents—9%; Army Aircraft Accidents—40%; Military Personnel Injuries—17%; Civilian Personnel Injuries—1%.

From a dollar standpoint, the total injury costs were reduced by approximately $130 thousand and the total property damage costs by approximately $60 thousand.

• • •

Demonstrations of latest equipment and fire-fighting techniques, the launching of 500 balloons as part of a contest and numerous displays and posters marked Fire Prevention Week at the Shawinigan, Que., Works of Du Pont of Canada. The plant, which has about 700 employees, placed first in the Canadian industrial division in the 1958 International Fire Prevention contest and fourth among North American industry. J. P. A. Laforest of the Quebec provincial fire commissioner's office presented the Laurin Shield to the plant during the week to mark the achievement.

The balloons, released to launch the activities, each carried a reply postcard addressed to an employee. A message dealt with fire safety and urged whoever recovered it to mail it in. Prizes were awarded to the employee receiving the card mailed from the furthest point and for the sender as well.

Other events included: A tour of the plant by "Sparky," an employee wearing a mask and outfit symbolizing the fireman's mascot, who later issued safety match booklets with a safety message and other literature to employees leaving the plant. A demonstration for employees of complete fire-fighting equipment used at the plant and techniques employed in combating several oil and gasoline fires purposely set for

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the event. A dinner and plant tour for 40 municipal firemen. Fire-fighting demonstrations for nurses and staff of local hospitals and pupils of local schools.

In addition, all foremen and supervisors wore bright red bow-ties during the week as walking advertisements for fire safety. Numerous streamers and posters were displayed in the plant and all outgoing mail and teletype messages bore a special fire prevention message. Fire safety displays were prepared by employees in all major departments of the plant.

Before the Week, a letter urging fire safety was sent to the homes of all employees by Works Manager A. L. Barry. The activities were planned and supervised by Safety Co-ordinator Harold Friendly and Fire Chief Joseph Boucher, both of the plant staff.

• • •

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National Safety Congress

(from page 25)

Who gets hurt more often in industrial accidents—the tired old veteran with years of experience, or the young, alert new employee? In a Canadian lumber company, it's the new employee. "Half of all lost-time injuries," declared W. D. Staniforth, manager of a division of Staniforth Lumber & Veneer, Kiosk, Ont., "occur to new employees within the first two weeks of work. Thus, "it is important that careful instruction and training be given new workers."

It's just human nature to have accidents, according to R. E. Lauterbach, a vice president and director of General Petroleum Corp., Los Angeles, Calif.

"What is it that makes human beings so contrary? I think it is because man has a natural resistance to obeying orders and to following rules. This is human nature. To protect humans, we need a safety program to teach them to protect themselves.

"The best path to success in safety is to get the workman's cooperation by showing him the benefits he personally receives by working safely."

Don't expect specific results with general instructions, says Ellis L. Stout, an official of the Los Alamos (N. M.) Scientific Laboratory. "Mass training methods," he said, "have many weaknesses. The training must, of necessity, be general. And the hoped-for carry-over from the general to specific conditions does not usually follow, since the specific interpretation is left to the worker." In place of mass safety education methods, Stout urged a "more personalized safety training."

A foreman can't sell safety with a "Don't do as I do, do as I say" attitude, according to A. H. Zeilinger, safety engineer, Industrial Commission of Colorado, Pueblo, Colo. He said, "today's successful foreman must have the respect of his men. He must be a leader, an instructor, an example."

THE FIRE FRONT

Outside Fire Protection

Practical guidance on providing fire protection for industrial plant properties is featured in a technical standard revised by the National Fire Protection Association. Important new recommendations cover fire pumps for sprinkler systems, control valves, hydrants, hose houses and fire hose.

Of special value to contractors are 17 new detailed sketches showing the covering pipe sizes, anchoring couplings and other fundamentals of installation. In addition, the standard has an easy-to-use certificate covering the installation and testing of sprinkler systems. The certificate helps the contractor provide essential information to the property owner to show that the sprinkler installation has been completed.

A completely new chapter in the standard covers the specifications for under ground pipes and fittings, and includes reference to other useful published specifications. The standard was developed over a period of years by the NFPA Committee on Standpipes and Outside Protection, chairmanned by K. W. Jamieson of the Canadian Underwriters Association. Copies (NFPA No. 24, 48 pages, 50¢ per copy) are available from the National Fire Protection Association, 60 Batterymarch St., Boston 10, Massachusetts.

Industrial Fire Control Conference

The 7th Annual Industrial Fire Control Conference will be held at Purdue University March 29, 30, 31, 1960. This 3 day course is designed primarily for the industrial fire chief and the plant fire specialists. It will again feature outstanding industrial fire control authorities, lecturers, and moderators. The fine array of speakers will explore the many facets of industrial fire prevention and fire protection. This conference is planned to assist in the development of a more effective fire safety program for industry. One session will be devoted exclusively to field trips to local industrial plants. The course of instruction will provide the basic techniques and methods of industrial fire fighting and fire prevention. It will consider the essential fire problems that confront both the small and large industrial plants.

This training course in industrial fire control is intended to help administrative and supervisory industrial personnel to deal more efficiently with the fire control problems and to reduce industrial fire loss through training. The program itself is planned to lend assistance to the experienced safety supervisor and also to provide training for new personnel.

For additional information and programs concerning the seminar, please address: Professor Shelby Gallien, Seminar Director, Public Safety Institute, Purdue University, Lafayette, Indiana.

October Losses Decline

Estimated fire losses in the United States during October amounted to $71,160,000, the National Board of Fire Underwriters has reported. This loss represents a decrease of 3.0 percent from losses of $73,393,000 reported for October, 1958, and a decrease of 14.3 percent from losses of $83,027,000 for September, 1959.

Losses for the first ten months of 1959 now total $872,047,000, a decrease of 1.4 percent from the first ten months of 1958, when they amounted to $884,204,000. These estimated losses include an allowance for uninsured and unreported losses.

How to Prevent Boiler Explosions

The causes of explosions in both industrial and domestic water and steam boilers, and advice on how to prevent them, is explained in the June "Technical Letter" of Syska & Hennessy, internationally known consulting engineers of New York. Edward J. Benesch, vice president and chief engineer, who wrote the pamphlet, states flatly, "Boiler explosions do not just happen. They are caused. The only thing required to eliminate them is reasonable care and periodic inspection of the safety devices."

Puffs, or slight explosions, are common in boilers, his article continues, but they are usually relieved through the chimney or air door in the boiler or burner with little or very slight damage.

Steam and hot water boilers have a plate attached to them stating that maximum working steam pressure is 15 pounds per square inch; for hot water heating, normally 30 pounds per square inch. Codes and local laws require a safety valve for a steam boiler; a relief valve for a hot water boiler. A spring built into the valve is set to permit it to open fully instantaneously, or "pop," when the pressure of the boiler exceeds the pressure for which the valve is set. A lever is provided so the valve may be popped manually.

The safety provision and valve action are similar for hot water heating boilers.

Boilers for other than residential use usually are insured against explosion and the insurance company inspects their safety provisions regularly and issues a certificate to the owner to that effect.

For power (steam pressures over 15 pounds per square inch) the N. Y. State Boiler Code requires

that after a certain number of years of operation the boiler operating pressure be reduced in steps of 5 psi at defined intervals.

With mechanically fired boilers —oil burner, gas burner or coal stoker—an electric switch, called an excess pressure switch, is provided, which is set at a pressure below that of the safety valve. This switch automatically will stop the burner or stoker when boiler pressure reaches that setting. On domestic-size steam boilers the excess pressure switch which controls the operating pressure is the "pressuretrol"; on hot water heating boilers it is the "aquastat" which controls the operating temperature.

Low Water Level

The greatest cause of steam boiler explosions probably is low water level, Mr. Benesch declares. In a steam boiler, the space within the shell is occupied by water in the lower portion and steam in the upper portion. Should the water "disappear" from the boiler and firing still continue so that the boiler becomes dry, water fed into the hot, dry shell will flash into steam instantaneously. The steam may be generated at a greater rate than the safety valve can release it. If the pressure builds up beyond the designed pressure of the boiler (which includes a safety factor) the boiler will burst. Or, the water striking the hot shell or walls will cause them to contract suddenly and crack open.

Safeguards are provided against low water level. In coal-fired boilers, sometimes a fusible plug is provided which will melt when the water level drops below it, letting the water out of the shell and onto the fire, stopping further generation of steam.

No automatic safety devices are absolutely foolproof, so the safety or relief valve should be popped by the lever provided and the electric pressure switch tested frequently.

For mechanically fired boilers, an automatic low-water cutoff should be provided. This is a device which instantly stops the burner or stoker when the water in the boiler drops below the predetermined safe working level. At frequent intervals the low-water cutoff should be tested.

Low-water cutoffs are available which also automatically feed water to the boiler to maintain normal operating water level. They too should be tested frequently.

Oil and Gas Burners

Oil or gas explosion are caused by the ignition of an accumulation of oil vapor or gas in the presence of air.

Gas to the furnace of a boiler is supplied under pressure from the street mains, through a regulator, into the furnace. On initial starting, ignition (usually the equivalent of a large spark plug) should take place at the instant the gas enters the furnace. Should ignition be delayed, thereby allowing gas to accumulate in the furnace—Boom! Safety devices are required to guard against delayed ignition.

Oil to the furnace must be supplied as a mixture of a fine spray and air in order to burn. The air is furnished under slight pressure by a fan built into the burner. The mixture must be instantly ignited when it enters the furnace. Delayed ignition will result in an explosion unless safeguards are provided. Accumulation of unburned gas or oil vapor, suddenly ignited, results in an explosion.

This can take place in the domestic size furnace as well as the commercial size.

Delayed ignition does not take place only when the gas or oil is admittted to the furnace by a thermostat calling for heat. A leaky gas valve, even though the leak is ever so slight, can allow sufficient gas, particularly during the off-heating season, to enter and accumulate in the furnace so that when ignition does take place, an explosion follows. With oil, the burner may drip a slight amount into the furnace after it has stopped; the oil will vaporize and the vapor accumulate, so that when ignition takes place an explosion takes place too.

Delayed Ignition

To guard against delayed ignition for residential size boilers, a "pyrostat" is provided and usually is located in the smoke connection at the boiler. The pyrostat is an electric switch whose contacts are operated by a thermostatic element. The switch normally has closed contacts. Upon demand for heat by the thermostat, the switch is energized, permitting the burner to operate. If, after a predetermined interval of time the portion of the switch in the smoke pipe does not become hot, the switch opens and stops the burner. It will not start again until it is manually closed. The stopping and manual resetting cycle will continue until the trouble is cleared so that combustion of the oil or gas will take place and heat the switch.

The ignition stays on for a short period of time to assure full combustion of the oil and then automatically shuts off.

The pyrostat is usually combined with the ignition control as a single unit. The thermostat or other pressure or temperature controlling wires are brought into the unit and it becomes a "protectorelay."

After a normal shutdown due to satisfied boiler pressure or temperature, the burner will not restart immediately, regardless of whether the thermostat or other control is demanding heat. The pyrostat provides that a fixed period of time must elapse before the burner can restart. The reason for the time allowance is to "purge" the furnace; that is, to permit any remaining unburned gases to be drawn out of the furnace by the chimney.

Commercial Boilers

Commercial size boilers, which includes apartment houses, are more complicated. The average boiler is usually of the package type; that is, the boiler and the gas or oil burners are built as a single unit. The units are provided with a fan which either forces the gases of combustion through, or draws them from the boiler and discharges them into the chimney. Also, commercial size oil burners use the heavier grades (#5 and #6) of fuel oil. With the heavier grades of oil, a gas flame instead of an electric "spark" is employed to ignite the oil and air mixture. Safeguards

(Continued on page 46)

HOW TO FIGHT SOLVENT, STATIC HAZARDS

by **CHARLES V. WATSON**
Plant Engineer
Vulcan Rubber Products Division
Reeves Brothers, Inc.
Buena Vista, Va.

We have at our plant a serious fire and explosion hazard because of the wide use of volatile flammable solvents that may be set off by static electricity discharges or sparks. In spite of this risk, we have completed in three years more than two million man hours without disabling injury.

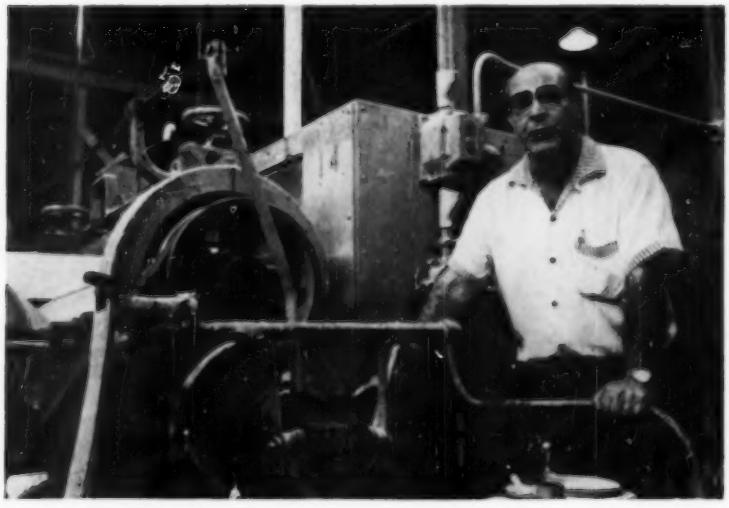
The Vulcan plant of Reeves Brothers, Inc., covers 107,000 sq. ft. and employs between 300 and 400 people. It manufactures a wide variety of synthetic rubber coated fabrics for industrial and other uses. Among the many products made are coated diaphragms for meters and controls, other industrial coated fabrics, neoprene and Hypalon coated nylon for tarpaulins and many other types of covers, and rubber offset and newspaper blankets.

The synthetic rubber used for the various coatings is compounded with a number of other ingredients in a mixing mill. The compound is churned, using toluol, heptane, and other volatile flammable solvents, until it has the correct viscosity needed for spreading. Then the compound is applied from a spreader to the base fabric, which has been treated with a bonding material. The coated material is finally cured, either in a steam or gas-fired hot air oven or in a steam vulcanizer.

All machines are grounded to avoid generation of static electricity. Regular checks of speeds and explosive vapor concentrations protect coating department.

At all stages of the production process, extreme care is necessary to avoid the generation of static electricity. Here are some of the measures we use:

- **All electric motors and lighting fixtures are strictly explosion proof.**
- **All machines are carefully grounded. Small wire brushes—so-called "magic wands"—are used on spreaders to pick up static from traveling fabrics and rolls. These brushes are grounded to the plant wet pipe sprinkler system.**
- **Coating machine speeds are carefully established according to type of fabric, viscosity and type of coating compound, and generation of static charges. Regular checks are made of machine speeds and**



Static-conducting belts are used on all V-belt drives. Machine safety guards aid protection against solvent dangers.

explosive vapor concentrations in the coating department to assure that a hazardous condition does not occur.

• All motors and machines have safety guards over exposed drive areas. V-Belt drives where used are equipped with static conducting belts.

• Any material that spills on the floor is immediately removed with a copper-alloy scraper, which produces no sparks. Floors are scrubbed with a nonflammable detergent.

• To minimize the chance of spilling containers with rubber compounds or solvents, a yellow line is drawn along the floor about two feet behind each machine. It runs the full length of the machine banks, and all material must be kept within this line to assure an uncluttered aisle for traffic.

• Employees wear shoes with conductive soles—either rubber or leather soles with hard toes—but no crepe-rubber.

• Because all windows, especially in winter, have to be kept closed to avoid drafts, a good ventilation system is provided. This minimizes dust and build-up of explosive vapor concentrations that are conducive to fires and explosions.

• All solvents are stored in underground tanks and pumped through pipes to the points of use.

• A safety man is assigned in each section. He is charged with watching his colleagues in the section and pointing out to them any violation of safety rules or other unsafe practices. He does this by quietly handing the culprit a little card which says:

> THAT WAS CLOSE . . .
>
> Do you realize that what you did a few moments ago could easily have caused an accident?
>
> Keep this card as a friendly safety reminder. When you see someone else flirting with danger, give him this card.
>
> P.S. Sure hope I don't get it back!

Yellow lines are drawn along floor about two feet behind machine. All material must be kept behind this line to assure an uncluttered aisle for traffic.

• A weekly check is made of all fire fighting apparatus. Dry chemicals are used in all extinguishers.

• And, of course, there are definitely NO SMOKING, and NO OPEN FLAMES permitted anywhere in the plant.

Torch and Electrode Safety Outlined

The worker with the torch or electrode in his hand is all too often heedless of the destructive fires the tool can set off. That is why cutting and welding stays high on the list of fire causes year after year.

"Sparks Astray" is a new National Fire Protection Association folder to deal with the situation. Designed primarily for the welder and cutter himself, it forcefully points out that a fire from his torch or arc can cause him injury or even cost his life, throw scores of plant employees out of work, and destroy property worth millions.

The four fire sources are listed with a graphic portrayal of danger spots—explosive mixtures of flammable gases, vapors and dust; fire tempters like oily waste; cracks and openings through which sparks may reach combustibles; and places where sparks or hot metal may lodge to smolder unnoticed.

Time for Safety

"Take time—to take care," the folder urges, in spelling out the basic rules for fire safety in handling cutting and welding jobs. It ends with a "count down"—four questions the torch and arc user should ask himself before he lights up.

The easy-reading two-color folder was prepared with the assistance of the NFPA Committee on Cutting and Welding Practices. Copies are available from NFPA, 60 Batterymarch St., Boston 10, Mass., at $3 per 100, $23.50 per 1000 and $21.50 per 1000 in quantities of 10,000.

Novel sentinel system monitors warehouse for fire and intrusion, permits remote control of access during off hours.

Warehouse Guarded by Remote Control

A **sentinel** system for monitoring a distant warehouse for fire and unauthorized intrusion has been extended one step by an industrial firm to permit access to the facility on off-hours by remote control.

The result is somewhat of an after-hours automation of the time-honored watchman's service, though a uniformed security guard calls the shots by code word from the main plant eight miles away.

The time- and cost-saving set-up, which makes use of telephone company leased lines bridging the warehouse and plant, is part of the 15-man industrial plant security system of Standard Pressed Steel Co., Jenkintown, Pa.

Part of the system is standard but sound procedure. When the day (and only) shift at the warehouse, in Horsham, Pa., closes up, the group leader phones the guard lieutenant in charge at the main security post at Jenkintown. The security officer sets the sentinel system for after-hours operation.

Monitors for fire and forced entry are wired via phone company lines back into a console control panel at the desk at the main guard post, a station that is manned 24 hours a day. A buzzer sounds and a light goes on to indicate either (a) fire or (b) illegal entry. A helpful addition is a meter needle which swings over to indicate in which of the three Horsham warehouse buildings the action has occurred. On receipt of an alarm, the guard officer immediately calls the township police.

Intercom System

As the time-saving added fillip, the steel company has added a voice connection between warehouse and plant to give authorized personnel from the main plant access to the warehouse without need of a key.

The individual needing access to the warehouse notifies the guard at the main gate that he is going up to Horsham. The guard gives him a code word for identification, making one up on the spot—let's say it's Seabiscuit, this time.

When he gets to Horsham he talks into a speaker above the main entrance that is always turned on (thus also permitting the guard to monitor noises there at all times), saying to the guard at Jenkintown, "This is Seabiscuit." The guard then presses the button to let him in 8 miles away.

The electrical system permits fast, minimum-red-tape access to the warehouse. The fuss of keys and the chance of losing them or having them fall into the wrong hands is eliminated. And by making the code word up each time, there's no chance of having it become public property and little opportunity for authorized personnel to forget it.

The main plant control panel also provides instant check, by light and buzzer, if the warehouse door is left open after hours.

The system isn't an automatic solution to security in remote facil-

ities of all kinds . . . certainly not in manufacturing or process buildings. By example, Standard Pressed Steel's nearby Columbia plant has round-the-clock security watch on the premises—guards who report back every hour to the main plant guard center in Jenkintown, on third shift, weekends and holidays.

Picture by courtesy of Pinkerton's National Detective Agency, Inc.

Boiler Explosions
(from page 42)

similar to those for the residential size burner must be provided for the commercial size.

The pressure switch and the low-water cutoff are similar to those for the smaller size burner.

The pyrostat for flame failure protection is not used, because its sensing element is small and its location would be too far from the fire. Instead, a photo cell type control is used. The photo cell "sees" the main flame, whereas the pyrostat "feels" the temperature of the flame.

A detector also is provided for the gas pilot flame. The burner will not start should the pilot flame be out or not of the right size to ignite the oil or gas properly.

Another safety cycle is included in the burner operation for the package type boilers. After the burner shuts off, the draft fan continues to operate for a predetermined period of time to purge the boiler of any unburned gases; and again, before the burner starts, the purge cycle takes place. An electrically operated fuel valve, operated from the pressure and/or other heat controlling device, controls the size of the main flame, which is closed during the purge period.

The same protective devices are provided on other than the package type, which require independent fans for their air supply. The fan is built into the burner, but is not required to produce as high an air pressure as that for the package type boiler.

"Automatic controls and burners are built for hard wear, but **they must be inspected and maintained in proper working condition.**" Mr. Benesch emphasized.

To burn properly, the fuel must receive an adequate supply of air. The air must come from the boiler room or cellar. The source of the air is from an opening directly to the outside. This opening must never be closed or covered. Unless a direct outside air opening is provided, the burner will draw the air from the cellar. The air pressure in the cellar can be reduced below that within the boiler or furnace. The result will be that the fire will be blown out of the boiler and into the boiler room or cellar.

New York City laws require and fix the size of outside air openings for combustion air.

The Rules and Regulations of the Board of Standards and Appeals and the Department of Air Pollution Control of the City of New York require the filing of plans with the city before an installation is made, and an inspection by the city of the installation of all fuel oil burning systems.

Truck Driver Courses

The 1960 bulletins for the truck driver training school at North Carolina State College are now available through the extension division which conducts the monthly courses. The eight-page brochures contain all basic information about the four-week courses in addition to application forms, photographs, and the 1960 schedule.

The school calendar of courses for 1960 is as follows: Jan. 4—Jan. 29; Feb. 1—Feb. 26; Feb. 29—Mar. 25; Mar. 28—Apr. 22; May 2—May 27; May 30—June 24; July 5—July 29; Aug. 1—Aug. 26; Sept. 5—Sept. 30; Oct. 3—Oct. 28; Oct. 31—Nov. 25; Nov. 28—Dec. 23.

Since August of 1949, North Carolina State College, in cooperation with the N. C. Motor Carriers Association, has presented monthly training courses for professional truck drivers. At the present time, classes are filled until February, 1960. Those interested in attending should apply in advance to be assured of a place in the forthcoming schools. For further details, write to: The College Extension Division, P. O. Box 5125, State College Station, Raleigh, N. C.

Electrical Progress

An annual report that reviewed the high spots of a year marked by more than the usual number of industrial problems was given at the annual meeting of the National Electical Manufactures Association by its president, Joseph L. Singleton, senior vice president, Industries Group, Allis-Chalmers, Mfg. Co.

Mr. Singleton divided his report into activities by NEMA Committees and by representative NEMA Sections. Following are summaries of sections that are of interest to the safety and maintenance fields.

The **National Wiring Bureau**, NEMA's largest industry-wide program to further the adequate wiring and wiring modernization in homes and commercial structures, continued to operate as an "inter-industry" team in the wiring field with power suppliers, electrical contractors, distributors and electrical leagues all sharing the planning and the work load.

Wire and Cable Section—initiated a program to promote safe handling of wire and cable in transit, began production of technical handbooks on wire and wire products, and sponsored a 3-day conference on industry and economic problems.

Busway Section—conducted an educational campaign among contractors, architects, builders, electrical inspectors and others about the advantages of installing bus duct systems.

Wiring Device and **Molded Case Breaker Sections**—joined in a program to study new electrical insulating materials.

X-Ray Section—joined with the Radiological Society of North America in a coordinated program to assemble information to minimize unwanted radiation, and to develop recommendations concerned with legislation and regulations on radiation problems.

Dry Battery Section—began a study of so-called "exotic" energy sources, such as fuel cells and solar cells.

Edited by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . .
Master Superior Court, New Jersey American Bar Ass'n, New Jersey Bar Ass'n, Chairman, Committee on Workmen's Compensation, New Jersey Bar Association National Federation Insurance Counsel Past Commander, American Legion, Post 10, ... Newark, N. J.

HEART CONDITION—Coronary Thrombosis—No Causal Connection

The deputy's findings, upon which an award was based, were not supported by any substantial competent evidence. The decedent suffered an attack of coronary thrombosis with infarction, later developed pneumonia and died. Although the decedent's widow, his brother-in-law and his cousin, all testified as to conversations they had with the decedent after his admission to the hospital, no one had any personal knowledge of the conditions leading to the deceased's admission. Their testimony indicated that the deceased became ill while working in a metal railroad gondola car unloading gravel. The deceased became over heated, left the car to cool off and subsequently returned to his job. He felt a sharp pain in his chest at this time.

The court accepted the defendant's contention that there was no competent or substantial evidence in the record to sustain the deputy's findings that the decedent became overheated while working in the course of his employment, because the relatives' testimony was uncorroborated, hearsay evidence. The Court stated that even if the decedent's overheated condition preceded the coronary attack, the medical testimony proved little more than that the overheated condition could have triggered the attack to the same extent as could have a number of other causes unrelated to the employment. The claimant failed to establish that the overheating, which resulted from the employment, triggered or precipitated the coronary attack which ultimately resulted in death. Certiorari granted and cause remanded with directions to dismiss the claim.

Covell Construction Co. vs. Burgess: Florida District Court of Appeals, First District No. B-254. Oct. 22, 1959.

HEART CONDITION—Strain and Exertion—Heart Attack

The lower Court properly ruled that the decedent's death from a heart attack did not constitute an industrial injury as contemplated by the Compensation Act, because there was no direct evidence that the deceased actually changed saw blades on Sept. 22, or that the change was accomplished by either of the methods requiring strenuous lifting effort. The Court held that inferences, drawn from circumstantial evidence, can be sufficient to prove a cause of action, if they satisfy certain requirements. Here, it may be reasonably inferred that the decedent actually did change the saw blades on the morning of his heart attack because it was a part of his duties, other workmen saw him coming from the saw room, and his hands and clothes were dirty. However, upon this inference the Court would have to further pyramid another inference that he did the work by either one or more of the strenuous methods, rather than by one of the easier methods, and another inference that the effort he exerted exceeded that used in his ordinary or usual routine. The Court concluded that in view of the evidence that the decedent had done this work at least once each week for ten years, it would be reasonable to assume that whatever method he used on the morning of this attack would not be such a departure from his usual routine as to establish an industrial accident. Affirmed.

Williams vs. Dept. of Labor and Industry: Washington Supreme Court, No. 34780. Sept. 17, 1959.

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The Post Office has divided 106 cities into postal delivery zones to speed mail delivery. Be sure to include zone number when writing to these cities; be sure to include *your* zone number in *your* return address — after the city, before the state.

KEEPING UP WITH

FLOOR MAINTENANCE SERIES
other articles in Nov. & Dec.

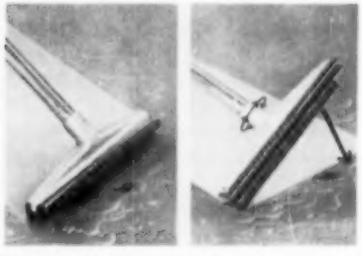
VERSATILE DRY VACUUM

Announced by Nobles Engineering is a new dry vacuum unit the "SpeedClean." It is designed to perform in one trip a complete dry maintenance clean-up as usually required daily in offices, plants, schools, hospitals, and hotels. It vacuum cleans rugs, hard floors, walls and overhead trim with its hose, wand and accessories that are available. Special feature is the disposable filter dust bag at the rear of the machine. Incorporated on the unit are large refuse collection bags which are reusable, have draw strings at the top, and are supported by the base to facilitate easy removal. Another innovation, the dust-mop well, allows dust mops, dust cloths, erasers, etc., to be shaken inside buildings without stirring or spreading dust. The operator diverts suction of regular vacuum motor to the mop well. The utility basket will carry average supply of towels, soap, waxes and cleaning compounds needed for washroom maintenance.

For details, use **Key # FM-1** on inquiry card on page 1.

SCRUBBER & PICK-UP TOOL

A special floor tool, particularly useful in the maintenance of hospital operating rooms, is announced by The Kent Co., Inc., for use with their recently developed Microstat Vacuum Cleaner which provides bacteria-free filtering of air in hospitals, laboratories, pharmaceutical and food plants, etc. The new dual-purpose tool functions for both wet pickup and "spot scrubbing" after the operating room floor is flooded with a germicide solution between operations. To switch quickly from wet pickup (pictured at left) to the scrubbing position (at right), the attendant simply rotates



the handle about 90 degrees, standing the tool on its end, and then presses down on the handle to complete the turn of the tool. This brings the brush into position to loosen stubborn spots before turning the tool back to wet pickup for drying the floor.

For details, use **Key # FM-2** on inquiry card on page 1.

SPONGE-PLASTIC PADS

Miller's "Micro-Bubble" Floor Machine Pads are being introduced as a new and different line of pads, for scrubbing, stripping, buffing and polishing. Made and marketed by Orchard Hill, Inc., they employ several features developed by the firm in the manufacture of various sponge products. The new pads are made of a "micro-bubble" plastic that is pliable, porous and ex-

FLOOR MAINTENANCE DEVELOPMENTS

tremely tough, to loosen dirt and develop maximum efficiency of soaps and detergents. The pads are made of two layers of the plastic, laminated by an exclusive process (patents pending) reducing torque and adding to the durability and effectiveness.

There are three models. The plain or "stone" pad, is used for scrubbing terrazzo, ceramic, slate and stone floors in particular. The second, for stripping and scrubbing, is impregnated with powdered abrasives for fast, thorough cleaning with no bleaching or scratching of floor materials. The third has an integrated buffing and polishing agent, which is said to give a beautiful finish to all floors. It is said the pads do not crumble or unravel; are not harmed by oils, greases, waxes, soaps or detergents; are odorless, rot-proof, non-allergic and sanitary; and are easily cleaned by rinsing and squeezing dry.

For details, use **Key # FM-3** on inquiry card on page 1.

RESURFACING COMPOUND

For long wearing repairs, as well as clean, attractive appearance, The Monroe Co., Inc., has announced an improvment in its "Swift Floor" repair material. It resurfaces or patches worn concrete or wood floors, inside or out, in minutes, avoiding closing down areas for any period of time.

The newly developed Ionization Process gives almost complete resistance to abrasion and shock. Monroe engineers report that one of the Air Force Bases has tested "Swift Floor" with Ionized Cryptolite on jet runways and found it highly successful.

For details, use **Key # FM-4** on inquiry card on page 1.

WET OR DRY VACUUM

A new line of wet-and-dry pickup vacuum machines has been developed by Multi-Clean Products, Inc. Designated the "Imperial Series," they are powerful and versatile floor maintenance machines. The three types of head assemblies, enclosing horsepower of ½, 1, or 1½, can be adapted to any one of the three sizes of tanks which hold 7, 12, or 17 gallons.

The large wheel and handle assembly in the rear make the units easy to transport from one level to another and the two ball-bearing swivel type casters in front provide excellent maneuverability. The oversize, stabilized motor brushes which are exclusive with these units assure increased brush life and less commutator wear. The motor assemblies are completely by-passed. Tank is easily drained through an opening in rear. A mechancial float prevents over-filling of the tank during wet recovery.

For details, use **Key # FM-5** on inquiry card on page 1.

BLACK TOP SEALER

Revco Pavement Sealer, a product of the Revere Chemical Corp., will lengthen the life of asphalt and black top surfaces many years. It is said to double the life of a pavement at $^{1}/_{10}$ the replacement cost. Surfaces subjected to gasoline, oil, or other petroleum products are protected from deterioration. It penetrates and gives air-tight coverage for resurfacing and protecting driveways, gasoline station aprons, fuel ramps, airport runways, parking lots and similar areas. It prevents cracking resulting from moisture penetration and subsequent freezing.

For details, use **Key # FM-6** on inquiry card on page 1.

NEW FLOOR COATING

Whistl-Phane, a new non-wax, extra-safe floor coating has been made available by the Whistlclean Corporation, a subsidiary of L. Sonneborn Sons, Inc. Described as exceptionally slip-resistant, it is recommended for the maintenance of composition floor surfaces (asphalt, vinyl, rubber, linoleum, vinyl, asbestos, etc.) and is formulated from plastics used in the manufacture of thermo-plastic sheets, tubes, bags and similar flexible products. It dries quickly to a self-polishing, tough finish, that will outwear conventional water emulsion wax films, says the manufacturer. The coating can also be easily and quickly removed.

For details, use **Key # FM-7** on inquiry card on page 1.

GERMICIDAL FLOOR CLEANER

Said to be 3 to 6 times more powerful than ordinary germicides, new "Elimstaph #2" cleans, disinfects, sanitizes and deodorizes in a single operation. It destroys Golden Staph and most other known pathogens, spores and fungi by penetrating the wall of the germ cell and disintegrating the entire organism from within.

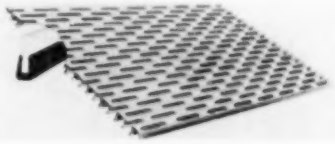
Residual in its action, "Elimstaph #2" has a phenol coefficient of 33 (certified by U.S. Testing Co.). The only product of its kind to earn the York Quality Research Seal, it is colorless, odorless and exceptionally low in toxicity. Besides floors, it is recommended for use on walls, furniture, equipment, lavoratories, shower stalls, utility closets, garbage cans, etc. One ounce makes a gallon of mopping solution. A sample for testing purposes may be obtained from the manufacturer, Walter G. Legge Company, Inc.

For details, use **Key # FM-8** on inquiry card on page 1.

FLOOR SLIPPERINESS TESTER

A new floor surface tester, manufactured by the Frazier Engineering Co., is designed to give an accurate measurement of the slip-resistance coefficient of any kind of surface. The Slip-Meter is made of spark proof metal and can be used safely in hazardous areas, such as industrial plants, refineries, and hospitals, as well as in office buildings, the manufacturer reports. The instrument is compact and portable, and readings can be made quickly and easily by any person. Slip measurement is computed by moving parts which register the culminating point on a scale. The scale is calibrated to record the reading point directly and no further computations are necessary. Can be used on any type of floor to determine whether it is slippery or safe.

For details, use **Key # FM-9** on inquiry card on page 1.



SNAP-LOCK ALUMINUM GRATING

A new lightweight, high-strength extruded aluminum grating, featuring an exclusive snap-lock method of field assembly which eliminates need for welding, has been introduced by the Read Standard Division of Capitol Products Corporation. Suitable for all types of pedestrian walkways, including platforms, scaffolding, balconies, and catwalks, the Readco Extrud-Lock grating is available in 1", 1¼", and 1½" thicknesses, in 6-inch wide extrusions in any specified length.

The snap-lock fastening method consists of an aluminum clip which is easily hammered into place. Any width of panel can be assembled in the field or at the job site. The aluminum clip ties together the interlocking I-beams on the mating edge of each section. The new grating is particulaarly suitable for any application where light weight combined with corrosion resistance, low maintenance, non-sparking, and non-slippage is desirable. It will meet or exceed strength specifications of Navy Spec. MIL-G-18015 (Ships) 20 May 1954.

For details, use **Key # FM-10** on inquiry card on page 1.

LATEX-CEMENT PATCH

A fast self-curing, easy-to-mix latex cement patch product for repairing everything from a crack to a big hole in concrete or masonry, has been developed by The Flintkote Company. Latex Cement Patch assures a tight, non-shrinking bond, tough, non-brittle toppings, and reduces shrinkage to a minimum, the manufacturer reports. A general purpose compound which requires no primer and needs but a trowel or spatula to apply, it was especially formulated for use in area patching of concrete floors, walls, structural parts, beams, columns, foundations, curbs, railings and even complete surface refinishing from $\frac{1}{16}$ inch up in thickness.

The patch consists of latex (liquid binder) and powder (dry, premixed cement and fine aggregates) supplied in complete packages. The product sets hard in a smooth, uniform surface.

For details, use **Key # FM-11** on inquiry card on page 1.

WAXLESS FLOOR FINISH

Britecote is a true "non-buff," "non-skid" waxless floor finish for all composition floors, according to its manufacturer, The Selig Co. Provides clear, hard, bright, resilient and slip-proof surfaces on asphalt tile, linoleum, vinyl, wood, terrazzo and cement floors. No scuffs, powdering, streaking, smearing. Simply clean floor and allow to dry before applying Britecote. One coat is usually adequate except on extremely porous surfaces. A second coat can be applied in about 30 minutes if necessary.

For details, use **Key # FM-12** on inquiry card on page 1.

TRANSPARENT FLOOR POLISH

Contrast, a new non-slippery, wax-free floor polish, is now being introduced by Huntington Laboratories. It has been developed especially to prevent discoloring or darkening of vinyl, asphalt tile, vinyl asbestos, linoleum, terrazzo and rubber tile floors. According to the company, the self-shining polish has a water base which will not discolor even pure white floors and its tough, glossy finish withstands heavy traffic. One gallon will cover 2,000 to 2,500 square feet. "Contrast" will not water spot, powder or flake off; resists black marks and scuffs.

It requires no buffing except to renew the gloss after heavy use. It is easily stripped, when necessary. Generally, the only required daily maintenance is mopping with a treated dust mop. Like all Huntington waxes and wax-free polishes, it has built-in protection against bacterial contamination while in storage.

For details, use **Key # FM-13** on inquiry card on page 1.

DEMONSTRATION UNIT OF RESURFACING COMPOUND

A special free demonstration unit of Chemi-Top Floor Surfacing Material has been announced by The Garland Co. Chemi-Top is an unusually tough surfacing material. The demonstration unit, installed by a Garland representative in a section of a "problem floor," lets factory superintendents check Chemi-Top's resistance to wear and corrosion before resurfacing their floors.

The manufacturer points out that, even though certified laboratory tests show Chemi-Top has four times the compressive and bonding strength of concrete, cost-conscious maintenance superintendents want to be shown before committing themselves to a floor repair program. Chemically inert, the product is unaffected by salts, oils, alkalis, grease, most acids, or strong industrial chemicals. Applied only ⅛" thick, it bonds firmly to concrete, metal, or wood—takes steel-wheeled trucking and crushing impact.

For details, use **Key # FM-14** on inquiry card on page 1.

40 Page Catalog of Safe Driver . . .

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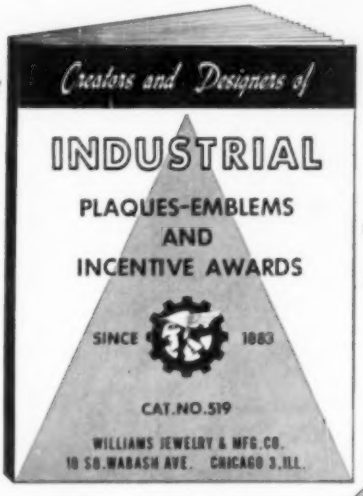

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(For details, use Key # N-13 on card on page 1)

GRADUATED BUCKETS

Market Forge Co., in response to demand by custodians and housekeeping departments of hotels, hospitals, schools and other institutions, has announced that all Green Label buckets are now graduated in gallons for simplified and money-saving measurement of all floor cleaning solutions.

Available in galvanized or stainless steel, with Rol-Easy Ball-Bearing Casters, the new buckets have graduations embossed for permanent identification and are clearly visible both inside and out. Total capacity of each bucket also is embossed for easy selection.

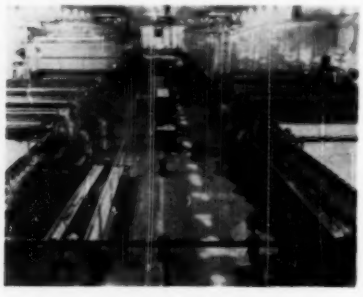
The new graduated buckets allow exact measurement of all cleaners, disinfectants, detergents, sealers and waxes; assure properly mixed chemicals; eliminate unnecessary waste; help indicate, by number of gallons, when worker should change rinse water and cleaning solutions.

For details, use **Key # FM-15** on inquiry card on page 1.

AIR JET VACUUM CLEANERS

The Spencer Turbine Company has announced the availability of "Air Jet" vacuum cleaners. These new portable units, already being utilized by aircraft manufacturers, have no moving parts, no motors and no electrical wiring. Hence there can be no sparking and the cleaners can be operated in hazardous areas. Power to operate the units is obtained by connecting them to compressed air lines existing in the plant. Units are available with a 2-inch or 3-inch air jet. The 2-inch size has an air supply requirement of 20 CFM at 80 psi. The 3-inch jet uses 40 CFM at 80 psi.

For details, use **Key # FM-16** on inquiry card on page 1.

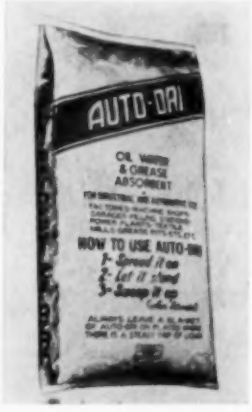


CORROSION RESISTANT RESURFACER

A new floor patching and resurfacing material put out by the Flexrock Company has excellent adhesion to any clean surface—even if it is damp—assuring feather-edge patching, grouting, repointing of tile or brick, or resurfacing. It is designed for floors subject to acids, alkalis, salts, oils, fats, grease, water, slip-hazards, trucking, or abrasion. Used in food plants such as bakeries, breweries, dairies, flour mills, etc. and in various industrial plants such as pulp and paper mills, tanneries, waterworks, bottling plants, chemical plants, etc.

Material will take any traffic the sub-floor can. It is shock-proof, non-flammable, warm and quiet to the feet. Any handy man can install it—inside or outside on concrete, wood, asphalt, metal, brick or composition, and overlays can be made at only ⅛ of an inch. It is ready for use in 18 to 24 hours. Four colors plus natural to choose from.

For details, use **Key # FM-17** on inquiry card on page 1.



NON-COMBUSTIBLE FLOOR ABSORBENT

An economy-grade mineral floor absorbent, slip-proof and non-combustible, is being introduced by the Speedi-Dri Division of the Minerals & Chemicals Corp. of America. It is intended for use where a lower absorbency is suitable. AUTO-DRI is a granular mineral which automatically absorbs liquids, removes them from the floor and prevents them from being tracked to other areas. It absorbs liquids without becoming mushy, and provides a slip-proof surface. Spread quickly by rake or broom, it cleans oily or greasy floors and can be swept up for use again. It protects wood or composition floors from sparks generated by welding, grinding and similar operations. It absorbs oil and grease drips to reduce fire hazards and floor cleaning expense and to prevent slips and falls.

For details, use **Key # FM-18** on inquiry card on page 1.

NON-SKID PAINT ADDITIVE

Cat Grip, the new, non-skid compound which may be added to any paint, lacquer, enamel or varnish, is being produced by the Solfo Paint Mfg. Co. Cat Grip provides a non-skid, high-friction additive base which will not change the color of the paint with which it is used. It has a wide variety of uses and is an added safety factor for boat decks, docking platforms, scaffolds, cement floors, stair treads, etc. It is available in ¼-pound packages and also in larger units for industrial and plant maintenance requirements.

For details, use **Key # FM-19** on inquiry card on page 1.

NEW SAFETY FLOORING

A floor covering, reported to have great versatility, has been developed by the Midwest Resilient Floor Co. for application in industrial plants, trucking areas, loading docks, etc. The company claims the following features for Gran-I-Wood, a plastic cement and hardwood sawdust composite: Flameproof up to 3,200 degrees Fahrenheit; grease-proof and acid resistant; impervious to heat, cold

and other climatic conditions such as moisture fluctuations; may be installed over many other flooring materials, with minimum surface preparation; noise absorbent; non-slip surface; resistant to germ growth; anti-fatigue resiliency; vermin-proof; will accept nails, screws, cleats, and metal anchoring for heavy pressure areas; never buckles or shrinks, and is considerably lighter than most floorings; and, it is a permanent installation which may be used over an entire floor, or in heavy stress areas.

For details, use **Key # FM-20** on inquiry card on page 1.

DUST-CONTROL POWER SWEEPER

A rider-type power sweeper, to provide dust-free sweeping and cover up to 100,000 sq. ft. per hour, has been announced by Clarke Floor Machine Co. The new Clarke Model ERS-36 sweeps a 36-inch swath and can be equipped with one or two optional side brooms for sweeping right up to walls. The sweeper is compact, has a turning radius of 66 inches and high maneuverability. Its hydraulically operated debris hopper holds 750 lbs. (seven cubic feet).

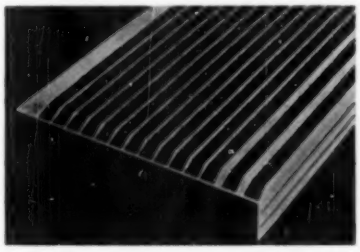
It has a 7 hp. 4 cycle gasoline engine, or can be furnished with an LP gas equipped engine. It also has an automatic clutch and power transmission. The sweeper's 17-inch diameter broom has 16 individual replaceable brushes and can be adjusted to 23 different positions for maximum brush life. Its dust control system, with turbine fan and dust filter, removes all dust from broom chamber and debris hopper. The unit may be used on all types of surfaces, both indoors and out-of doors.

For details, use **Key # FM-21** on inquiry card on page 1.

REUSABLE SCRUBBING PAD

A scrubbing pad designed for vigorous cleaning of rubber, vinyl and other resilient tile, linoleum, and wood floors without removing the entire wax film has been introduced by Minnesota Mining and Manufacturing Co. Called the "Scotch-Brite" brand Floor Scrubbing Pad, the product is of a flexible, non-rusting nylon construction which can be easily cold-water rinsed and squeezed damp-dry for immediate re-use or complete drying. The pad removes surface dirt, heel marks and scuffs, removing the least amount of wax. All that is necessary thereafter is to apply a light coat and re-buff. The product is designed for use with the "3M" brand Driving Pad. Even where floors are uneven, molded rubber "fingers" on the face of the driving pad provide active support, and longest possible pad life. The scrubbing pad is usable on both sides. Similar pads for stripping and polishing also available.

For details, use **Key # FM-22** on inquiry card on page 1.

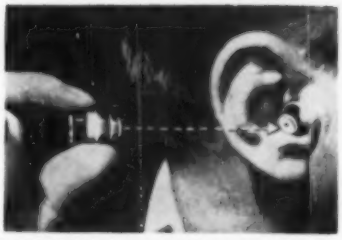


NON-SLIP ALUMINUM TREADS

A new "Traffic-Flow" design for heavy-duty aluminum safety treads has been developed by Wooster Products, Inc. The slip-proof design has a flat abrasive surface that provides a "magnetic-like" feeling, prevents slipping and tripping, and enables handling of large crowds on stairs without accident. The Super Stairmaster treads are distinctive in appearance to meet requirements of department stores and hotels, but are rugged and and have passed oil and grease tests more severe than those encountered in most factories and packing plants, it is reported. The treads are 9" wide; length to 12' as required. A deep 1⅛" nose of heavy aluminum extends over the edge of the step. The treads are simply fastened down with screws on wood steps or on masonry stairs with screws and lead expansion shields.

For details, use **Key # FM-23** on inquiry card on page 1.

HARMFUL Effects of **NOISE** to the **EAR DRUMS ELIMINATED** by *Lee Sonic* **EAR-VALVS**



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(Use Key # N-15 on Inquiry Card on page 1)

BATTERY POWERED SCRUBBER-VAC

Two models of a battery powered scrubber-vacuum floor maintenance machine have been introduced by Finnell System, Inc. Called the Mark 20 and Mark 26, the Finnell scrubber-vacs are engineered to clean up to 21,600 square feet of floor per operating hour in industrial or mercantile areas where the unit must cover long distances and where extension cords would hinder operation.

The quiet action of the battery driven machines makes them suitable for schools, hospitals, institutions and other places where noise reduction is desirable.

The scrubbers are powered by four batteries with an operating life of six to eight hours. As part of standard equipment of the series, a small, compact battery charger is included. The Mark 20 will clean a path 20 inches wide; the Mark 26 will clean a 24-inch width. Both models have a 17-gallon solution dispenser tank, a 19-gallon pick up tank, and counter rotating brushes to eliminate torque.

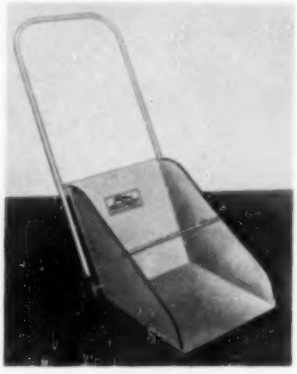
For details, use **Key # FM-24** on inquiry card on page 1.

NON-SLIP WATERPROOF FLOOR

An unusually versatile compound that can be used for resurfacing floors, roofs, ramps, platforms, and for waterproofing surfaces has been developed by Horsey, Robson & Co., Inc. Called "Horsey-Set" Waterproof Decking, this heavy-duty material withstands all types of foot, vehicular and equipment traffic, including 55-gallon drums and the weighted, narrow wheels of dollies; is resistant to sun, rain and weather; is unaffected by boiling water, steam, gasoline, oils, grease acids, and alkalies. Only a single thick coating is necessary for full protection. On floors and walkways the material provides excellent slip resistance.

The resurfacing material has two separately packaged components which are mixed just before application. The decking compound can be used on metals, concrete, masonry, tile, wood, etc. It is recommended for food processing plants, beverage plants, hospitals, laundries, pulp and paper mills, solvent plants, textile plants as well as general industry. The decking is non-toxic and fume-free. The company also makes a tank-liner coating with the same characteristics.

For details, use **Key # FM-25** on inquiry card on page 1.

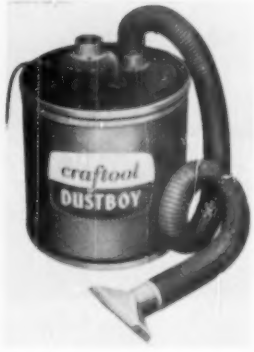


NEW SWEEPING CART

Handling Devices Company announces "Sweepcart," a new tool for dirt or trash pick-up and removal which eliminates shoveling and simplifies floor cleaning. This new unit is extremely practical and efficient; push it right up to (or into) the pile of dirt or trash to be removed. Quickly and easily sweep the material right into the dirt pan and wheel to disposal area.

"Sweepcart" is counterbalanced and has free-rolling solid rubber wheels. A new feature is that the lightweight dirt pan detaches from the handle and wheels for simplified dumping. Dirt pan is 19" wide; edges are rubber protected to prevent damaging other equipment. Finished in safety color baked enamel.

For details, use **Key # FM-26** on inquiry card on page 1.



DEBRIS AND DIRT VACUUM

Craftools, Inc. introduces the new "Dust Boy." A powerful (½ HP) shop-vacuum and dust collector, it is equipped with a 14 gallon drum, small enough to be extremely portable, but with a large capacity for those wood chips, sawdust and rough dirt found in shops, garages, etc. Supplied with a 2½" diameter hose (twice the size of the average vacuum hose) which will not clog on the rough refuse, it is designed so that debris falls directly into drum, by-passing the motor. Fittings are heavy plastic, tapered for quick attachment. The unit is supplied with an adapter to take any standard 1½" vacuum hose.

For details, use **Key # FM-27** on inquiry card on page 1.

CHEMICAL RESISTANT FLOOR

Superior resistance to chemical attack and mechanical abuse are claimed for Emeri-Epox, a new fast setting flooring material introduced

by Walter Maguire Company, Inc. It is recommended for topping or resurfacing concrete, wood, tile, stone, brick, and metal flooring; for setting tile; for resistance to water, steam, oil, grease, caustics, sugars and syrups, and practically every acid. The product combines a spe-

cially graded emery, a hard, tough non-absorbent material developed for heavy duty industrial concrete, and an epoxy resin, a tough, strong, 100% solid chemical binder.

Extremely resistant to abrasion and mechanical shock, the new material is applied in thicknesses from 1/16" to 1/4" and can be feathered to a membrane-thin edge. It is flexible, but won't shrink; is completely waterproof, and won't freeze. Surface is abrasive, therefore non-slip. It is supplied as a package containing two components, the dry mix of emery aggregate and epoxy resin, and a liquid catalyst. These are thoroughly intermixed just prior to application on clean, oil and grease-free, surfaces. Full curing results in eight to twelve hours at room temperature (70° F.).

For details, use **Key # FM-28** on inquiry card on page 1.

ROUGH SURFACE FLOOR SCRUBBER

Nobles Engineering & Mfg. Co. has announced the Speedscrub Floor Scrubber. Among the new features are a multi-sectioned brush designed to conform to surface irregularities automatically, scrubbing out shallow spots and over bumps as well. It has an all-metal back with bristles woven on to it by wire. The bristles are longer at outer edges so that when extra pressure is exerted, all bristles maintain contact with floor.

Brush and motor as one unit are mounted on "A" frame that is raised or lowered by 3 screw-jacks with one central control. This gives variable brush-pressure control to either scrub or strip surfaces such as composition tile, ceramic tile, wood, or cement. Brush will raise 1½" to clear door jambs, and will extend 4" under kick boards. Skirt height is 3".

The motor is electrically reversible. Water flow is adjustable by valve. Scrubbing water is directed to the center of brush so that inside edges of brush sweep water under total bristle area. Water flow can be regulated according to job being done. Tank has a capacity of 10 gallons and it is epoxy lined.

For details, use **Key # FM-29** on inquiry card on page 1.

QUIET VACUUM CLEANER

A new 10-gallon, silent vacuum cleaner for both wet and dry pickup has been introduced by Hild Floor Machine Co. Particularly suitable for light industrial and institutional use, the versatile new unit features a bi-pass motor with twin turbine fans and a special sound absorption system that gives substantially quieter operation. Large, shock-absorber bumpers prevent marring of furniture or woodwork.

For details, use **Key # FM-30** on inquiry card on page 1.

Chairmen for N. Y. Safety Convention

The appointment of the General Chairman and two general vice-chairmen for New York's thirtieth annual Safety Convention and Exposition was announced recently at the headquarters of the Greater New York Safety Council, 60 East 42nd Street.

Sponsored by the Safety Council with the participation of nearly all departments of the City Administration and local and national groups concerned with accident prevention, the Convention and Exposition will be held at the Hotel Statler Hilton, New York City, from March 28 through April 1, 1960.

Henry G. Lamb, safety engineer of the American Standards Association, is general chairman. Named as general vice-chairmen are O. P. Peters, superintendent of the New York engineering department of the Employers Group of Insurance Companies, and Arthur F. Fuller, supervising engineer of the Aetna Insurance Group.

Announcement of the appointments was made by Lewis R. Morrison, chairman of the convention interim committee. Paul F. Stricker, executive vice-president of the Greater New York Safety Council, is in charge of the convention administration. William J. Farley, assistant to the executive vice-president of the Safety Council, is the convention secretary.

Fire Standard for Solvent Extraction

A new standard for fire safety in solvent extraction plants has been published by the National Fire Protection Association. The solvent extraction process, largely used in extracting the oil from soybeans and other similar operations, presents a serious hazard by reason of the highly flammable solvents used. Such solvents, having fire hazard characteristics of gasoline, are used to remove the oils or fats and then must be separated from the oils and solids by another process also adding a hazard. Many fires and explosions have occurred in connection with this process.

The NFPA pamphlet offers its recommendations as a guide to fire safety, stressing that compliance with the recommendations will minimize the hazard. The standard was prepared by the NFPA Sectional Committee on Solvent Extraction of which Paul C. Lamb of Lever Brothers, New York, is chairman, and adopted at the Association's recent annual meeting.

The pamphlet (NFPA No. 36, 46 pages illustrated, 50¢ per copy) is available from the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

Safety Conferences Scheduled for 1960

The Industrial Safety Equipment Association has prepared the following schedule of regional safety conferences for 1960. For future details covering sponsorship, etc., see "The Future Shows" column elsewhere in this and future issues.

Date	Safety Conferences	Location
	March, 1960	
6–8	Southern Safety Conference	Jacksonville, Fla.
9–10	Philadelphia Safety Conference	Philadelphia, Pa.
15–16	Northeastern Indiana Safety Conference	Ft. Wayne, Ind.
16–18	Central States Safety Conference	St. Louis, Mo.
20–22	Massachusetts Safety Conference	Boston, Mass.
27–30	Texas Safety Conference	Dallas, Texas
3/28–4/1	Greater New York Safety Conference	New York, N. Y.
29–30	Northern California Safety Conference	Oakland, Calf.
	April, 1960	
4–5	Toronto Safety Conference	Toronto, Ont.
5–7	Western Pennsylvania Safety Conference	Pittsburgh, Pa.
11–13	Western Safety Conference	Los Angeles, Calif.
12–14	Michigan Safety Conference	Detroit, Mich.
12–14	Western New York Safety Conference	Buffalo, N. Y.
19–21	All Ohio Safety Conference	Columbus, Ohio
20–21	Central Indiana Safety Conference	Indianapolis, Ind.
25–27	West Virginia Statewide Safety Conference	Charleston, W. Va.
	May, 1960	
2–4	Eastern Pennsylvania Safety Conference	Easton, Pa.
5–7	Virginia Safety Conference	Richmond, Va.
4–6	North Carolina Safety Conference	Winston-Salem, N. C.
11	Mansfield Area Safety Conference	Mansfield, Ohio
12–13	Northwest Industrial Safety Conference	Seattle, Wash.
18–19	Oklahoma Safety Conference	Tulsa, Okla.
19–20	Lake Superior Mines Safety Conference	Duluth, Minn.
	September, 1960	
15–16	Maine State Safety Conference	Rockland, Maine
22–23	Governor's Industrial Safety Conference	Baltimore, Md.

Dates Not Set for 1960 Conferences

Connecticut Safety Conference
Louisiana Safety Conference
Camden, N. J. Safety Conference

No Exhibits in 1960

Central New York Safety Conference
Mid-West Safety Conference
Genesee Valley Safety Conference

Instrument Conference

The Houston (Texas) Section of the Instrument Society of America will act as host to the first of ISA's three Instrument-Automation Conferences and Exhibits scheduled for 1960. The Conference sessions will be held February 1–4 at the Rice Hotel, while the Exhibit will be staged in the Sam Houston Coliseum, February 2–4.

In outlining plans for the Winter Conference and Exhibit, John Johnston, Jr., President of ISA, said there will be 22 technical sessions at the Conference at which more than 60 papers will be presented. The Exhibit, which will occupy some 25,000 square feet in the Coliseum, will be devoted to display and demonstration of the newest products of the nation's leading instrument manufacturers and their representatives.

The Exhibit will include computers, measuring devices, transmission and telemetering instruments, data processing and information display equipment, control instruments and other elements and components of the newest products and services in instrumentation and automatic control.

Conference Subjects

Technical sessions of the Conference will be devoted to the concepts, techniques and applications of the scientific equipment and methods utilized by various industries, with special attention being paid to the petroleum, chemical, aeronautical, missiles and electronic, and scores of process industries. The key men of these diversified groups will participate in, or otherwise attend, the Conference sessions. Since the American Chemical Society's Houston Section will take an active part in the ISA Conference, papers will also be presented by ACS members on analytical laboratory instruments. Other papers will cover the structure and operation of the service facilities in companies using electronic equipment; maker-recommended procedures for service, installation and maintenance of various instrumentation equipment;

(Continued on the next page)

Safety on RR Sidings For Industrial Plants

The Institute of Scrap Iron & Steel, Inc. has outlined the hazards (and protective measures) encountered on railroad sidings in scrap yards. These safety problems are equally pertinent for railroad facilities of manufacturing and processing plants. As the Institute points out, even though the railroad is not owned by the yard or plant, the hazards it presents are important to personnel.

HAZARDS	PROTECTIVE MEASURES
Railroad and trucks, or pedestrians using the same entrance, with possibility of collision or striking someone.	Provide separate entrances for railroad, trucks, and pedestrians.
View at railroad entrance obstructed.	Make certain that flagman is posted when train is moving in an area where the engineer does not have full, clear vision.
Railroad and roadway crossings in the yard.	Make certain that flagman is posted when train must approach or cross such roadway.
Tripping hazard where persons must walk along track bed.	Have ballast placed so as to be level with top of ties.
Insecure rails or fishplates which may cause rails to shift and derail car.	See that rails are properly spiked and fishplates tight.
Open frogs, switches, and guard rails in which a person may catch his foot.	Have all frogs, switches, and guard rails suitably blocked with wooden blocks.
Possibility that car may roll or be pushed past end of track.	All spur tracks to be equipped with standard bumping blocks.
Possibility of catching a man between the rolling stock and a building or other equipment.	Provide obstruction guards and "no clearance" signs at points where cars come too close to permit adequate clearance.
Possibility of car set out on grade being set into motion.	Provide heavy chain blocking for wheels.

Instrument Conference

(from page 56)

electronic data handling featuring the latest techniques of solid state circuitry.

Decision to expand its Conference and Exhibit services to three major areas during 1960, rather than confining it to one nationwide conference, was reached by ISA because of the tremendous and rapid advancement and growth of instrumentation and automation in all parts of the nation. It was felt that time and expense could best be conserved by holding three Conferences and Exhibits during 1960, the first in Houston, February 1–4; the second in San Francisco, May 9–12, while the International Conference and Exhibit would be held in conjunction with ISA's 15th annual member's meeting in New York City, September 26–30.

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(Use Key # N-17 on Inquiry Card on page 1)

U.L. Service Film

With fire losses a yearly menace to life and property, America's builders are becoming more and more aware of the need for built-in fire protection. "Building for Safety" is a graphic film account of Underwriters' Laboratories vital service to the American public by testing materials and structures under scientifically controlled fire conditions.

Unusual Organization

This is the story of a unique laboratory—an organization dedicated to the public interest—where science and engineering are applied to the study of fire hazards of building materials. Floors, walls, ceilings, roofs, doors—all are tested in giant furnaces to see how they will withstand an actual inferno. There are scenes of massive floor constructions built inside the Laboratories, then placed over a furnace and exposed to roaring fire for four hours. Roof shingles are subjected to fire and high wind tests. Glass block walls endure flames almost to the melting point, then are pounded with a hose stream. The flame spread of building insulation is measured in a special tunnel furnace. These and many other products under investigation are shown in this color film "Building For Safety" (16 mm., running time 13½ minutes) available on free loan.

Send requests for film bookings to Underwriters' Laboratories, Inc.: (East of Adirondack Mountains) to 161 Sixth Avenue, New York 13, New York; (Middle West) to 207 E. Ohio Street, Chicago 11, Illinois; (West of Rocky Mountains) to 1655 Scott Lane, Santa Clara, California.

On-the-Scene Fire Film

An important new addition to film libraries is now available through the National Fire Protection Association. "LP-Gas Fire Control" is of special value to public and industrial fire departments and fire training schools as well as to the gas industry in general.

The 10-minute 16 mm color with sound film is an on-the-scene report of an outstanding job of fighting an LP-Gas tank truck fire. The Arcade, California Fire Department under Chief George W. Requa pre-planned for gas fire emergencies. The emergency struck one night when a truck-trailer combination carrying 8,000 gallons of liquefied petroleum gas was involved in fire.

The department was well-prepared not only to fight the fire but to record the action in detail on film.

Along with a clear, instructional commentary, the film shows what the department did, how its tactics worked out and other important elements of fire ground action. A spectacular sequence shows how relief valves function and how hose streams were used to get control of a tough situation.

Arrangements to make prints available have been made through NFPA's Gases Field Service. The film is a valuable and permanent addition to any fire film library. Orders for it, at $75 per print, may be sent to National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.

Dental Safety Film on Radiation Hygiene

Dental X-ray Equipment: Alteration for Modern Radiation Hygiene, a 16-mm, sound, color film, running time 18 minutes, is a new motion picture announced by the American Dental Association and the National Bureau of Standards, who have collaborated for 30 years in research on dental materials.

It is the first of a new series to be produced on radiation hygiene. The film shows the dentist how good diagnostic x-ray pictures may be produced with a minimum amount of radiation to the patient. Procedures by which the dentist can check his x-ray equipment for collimation and filtration of the useful beam, for tube head leakage and for adequate length of the timer cord, are shown. It demonstrates how the dentist can use high speed film with the some 80,000 x-ray machines currently available in dental office. As illustrated in the new motion picture, ultra-fast dental radiographic film may be used with a slow mechanical timer by reducing the milliamperage or by increasing the target-film distance. The recommendations are based upon those outlined in current dental literature and in the National Bureau of Standards' radiation handbooks, prepared by the National Committee on Radiation Protection.

Arrangements for loan or purchase may be made by writing the Office of Technical Information, National Bureau of Standards, Washington 25, D. C. and for loan to the American Dental Association Film Library, 222 East Superior Street, Chicago 11, Illinois.

The current purchase price is $60.89 f.o.b. and is subject to change without notice.

Harry L. Stanyon has joined the Sales Department of *FIBRE-METAL MIDWEST, INC.* in Chicago. Stanyon is a native of Vermont, and was previously employed in sales work in Eastern New York State. He attended Boston University and the University of Vermont and studied the business courses there. He will cover the Michigan, Wisconsin and Illinois area for Fibre-Metal Midwest, calling on welding and safety supply distributors only.

OVERLY MFG CO. has opened a new Midwestern subsidiary, *Overly Mfg. Co. of Missouri, Inc.* at 105 West Pacific Avenue, Webster Groves, St. Louis 19, Mo. *Howard F. Willis*, president of his own metal building products sales organization in St. Louis—and Overly agent and distributor in that area since 1953—will be in charge of the new subsidiary as ice-president and general manager. The new subsidiary will produce hollow metal door frames for the Midwest market and will serve as Midwestern production and distribution center for hollow metal products.

Grand opening of new facilities for *ZENITH RADIO CORPORATION'S* hearing aid division was announced by E. M. Kinney, Zenith vice president and general manager of the division. The location, officially designated as plant 5, is at 6501 W. Grand Avenue, and observed its official opening November 30, 1959. The 110,000 square foot plant accommodates executive and engineering personnel of the hearing aid division.

The home office and manufacturing plant of *FERNO MFG. CO.*, has recently been enlarged more than 50 percent, according to an announcement just issued by the company. In addition to more space for engineering and production departments, the enlarged facilities also include an entirely new office and display room for the many hospital and patient-handling products the company makes.

Southern Idaho Equipment Co., 2055 North Yellowstone Avenue, Idaho Falls, Idaho has been appointed by *WAYNE MFG. CO.* as authorized dealer for its complete line of power sweepers covering the state of Idaho, south of and including the Counties of Adams, Valley, Lemhi.

ALLEN B. DU MONT LABORATORIES, INC. has purchased the two-way mobile radio business of *Avia Products Co.*, according to an announcement by Walter H. Edge, manager of Du Mont's Industrial Electronics Division.

Avia Products has concentrated its mobile radio design and production on compact and weather-proof transmitter/receiver units for vehicle use.

Initial Du Mont production will be carried out at Du Mont's West Coast plant in Los Angeles so that there will be no interruption in delivery to present customers. Sometime in 1960 production and engineering of the units will be transferred to Du Mont's Industrial Electronics Division in Clifton, New Jersey.

Fred L. Beachler has joined the *TITMUS OPTICAL CO.* as Assistant to the President. In this capacity, he will conduct a study of the organization's personnel policies and will be active in other phases of management planning. This is the most recent appointment to the management staff in the interest of the company's progressive expansion program.

A native of Franklin, Ohio, Mr. Beachler is a graduate of Otterbein College, Westerville, Ohio, and has taken post-graduate studies at Ohio State University, Miami (Ohio) University, and Springfield (Massachusetts) College. From 1955 to September 28 of this year, Mr. Beachler was Assistant Director of Industrial Relations for the Bendix Aviation Corporation, Hamilton Division.

The purchase of the 48-year-old *Croker Fire Prevention Corp.* by the *FIRE-END PRODUCTS CO.* of New York was announced by Anthony J. Sposato, General Manager. The Croker concern has served the plumbing and building trades supplying fire protection equipment in commercial construction.

The new Fire-End acquisition will be operated as a division of the company under the direction of *Arnold Schildknecht* who has been manager of the Interior Fire Equipment Division.

LYON METAL PRODUCTS, INC. announced the purchase of a manufacturing plant on the West Coast. The plant, only two years old, covers 160,000 square feet, with more than 16 acres of land for expansion. It is located 18 miles from downtown Los Angeles.

The Los Angeles district sales staff and warehouse operation will move immediately into the new Lyon offices, which are a separate part of the acquisition. The complete equipping of the new plant with manufacturing and finishing machinery will require almost a year. It is expected that the manufacture of Lyon's major product line will start late in 1960. A complete warehousing function from the new plant will be operated in the interim period.

Safety Appointments

George W. Nickel, Jr. has been named Manager of Safety for the Armstrong Cork Company. In this capacity he will supervise safety programs on a company-wide basis. Mr. Nickel has served as Supervisor of Safety and Fire Protection for the Company's Floor Plant in Lancaster, Pa., for the past three years. He will succeed Amos S. Keen who is retiring after more than 46 years of service with Armstrong.

Kenneth B. Corbett has been named to succeed Mr. Nickel as Supervisor of Safety and Fire Protection at the Lancaster Floor Plant.

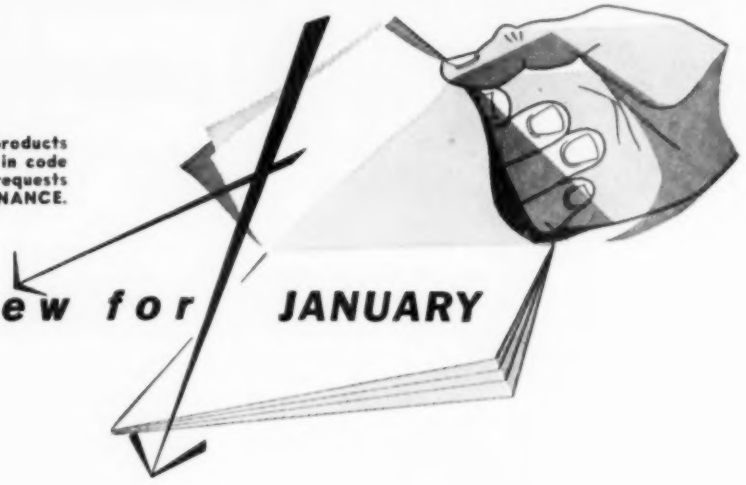
The promotion of *R. L. Corley* to Safety Co-ordinator for Minute Maid Corporation was announced recently by J. A. Podmore, Director of Industrial Relations. Corley joined Minute Maid in 1946 as a truck driver. In 1954 he was assigned to Transportation Safety where, according to Podmore, he has done "an outstanding job."

Appointment of *Robert M. Holderied* as District Safety Engineer for the Northeast Section of the United States has been announced by American-Marietta Company. The area includes Ohio, Pennsylvania, West Virginia, Virginia, Delaware, New Jersey, New York, Massachusetts, Connecticut, Vermont, Maryland and New Hampshire. He will be headquartered in Pittsburgh, Pa., where he will coordinate the accident prevention programs for American-Marietta's 65 plants located in the Northeast Section of the United States.

American-Marietta Company has also announced the appointment of *Theodore C. Raia* as District Safety Engineer for the west coast territory, including Western Nebraska, Colorado, West Texas, New Mexico, Arizona, California, Nevada, Oregon and Washington. He will be headquartered at Berkeley, California, where he will coordinate accident prevention programs for the company's 30 plants in the western area.

Material appearing in this section is published as information and is not intended to imply endorsement or guarantee by SAFETY MAINTENANCE.

To obtain descriptive literature of products listed, use Reader's Inquiry Card. Write in code number given each item. Send written requests to: Service Dept., SAFETY MAINTENANCE.



what's new for JANUARY

NEW GOGGLES & PLATE HOLDERS

(Use Key # 568 on Inquiry Card on page 1)

A NEW coverall goggle and a new plate holder for chippers and welders is available from Bausch & Lomb Optical Co. The coverall goggle is made of soft vinyl which easily fits over prescription glasses; lens rings are a matching molded acetate. Flexibility of material provides comfortable fitting to face and head contours. Air vents are nickel plated for clean appearance. Louvre style for welders is available in Arc-Ban welding glass and CR-39 plastic cover lenses are used for lens protection.

Both styles are assembled with a nickel plated steel adjustable head bar. Soft leather nose pads and attractive two-tone elastic headbands are outstanding features.

The flexible plate holder is designed to provide a wide area of vision and a secure but comfortable fit. The unit accommodates both welding plates or clear plastic cover plates. A slide, used to remove and replace plates in seconds, eliminates the need for clamps or hooks.

WATCHMAN'S REPORT FORM

(Use Key # 569 on Inquiry Card on page 1)

A WATCHMAN'S report form for use by protection personnel has been published by the Detex Watchclock Corp. Printed on 8½" x 11" sheets, the new form has a double purpose: (1) To remind the guard or watchman of all the dangers he must check, and (2) To provide a permanent record of conditions needing follow-up action, such as broken windows, leaking pipes, and similar hazards to life and property. This form is more detailed than previous editions, but is said to be easier to use because of its improved layout and design. Pads containing a year's supply are for sale.

AUTOMATIC LIGHT SWITCH

(Use Key # 570 on Inquiry Card on page 1)

AN ELECTRONIC switch with numerous safety applications in industry to turn lights on or off automatically is being offered by Schacht Electronic Mfg. Co. The small, versatile unit called the "Lightguard," actuates lights at dusk (when daylight reduces to about one foot-candle) and shuts them off at dawn (about 10 foot-candles). It can be easily installed in lighting fixture canopies, outlet boxes, and with suitable relays for the control of heavier electrical loads. Applications include automatic lighting of loading platforms, parking lots, warning lights, construction projects, chemical and petroleum plants, air conditioning systems, etc. Explosion-proof models are available for hazardous locations. The units are not affected by weather or temperature, and a built-in time delay prevents activation of the switch by temporary flashes of light, as from headlights.

LANOLIZED CLEANER FOR TILE

(Use Key # 571 on Inquiry Card on page 1)

A LANOLIZED cleaner for porcelain, enamel, and tile has been developed by the Davies-Young Soap Co. Buckeye DYD is designed to be used by hospitals, hotels, motels, offices, department stores, and industrial plants for cleaning bath tubs, refrigerators, and stainless steel, chrome and brass fixtures. The addition of lanolin makes the cleaner safe and gentle to hands. It is antiseptic, leaving surfaces clean and germ-free.

COLLAPSIBLE ESCAPE LADDER

(Use Key # 572 on Inquiry Card on page 1)

A LIGHTWEIGHT, sturdy, compact and inexpensive fire safety ladder is available from B. & R. Ladder Enterprises, Inc. Known as Speed-Scape, the unit has been tested and is claimed capable of supporting nearly three tons. When closed, it is less in diameter than the average rain spout.

The ladder is made from non-corrosive aluminum, can be quickly installed on any outside wall by being shot-bolted, and is adaptable to any two or three-story dwelling, factory or office building. The Speed-Scape can be opened instantly by a simple pull of a trigger-latch operable only from the second floor and above. The ladder's strength and rigidity prevent rocking and swaying.

SOUND & VIBRATION ANALYZER

(Use Key # 573 on Inquiry Card on page 1)

A PORTABLE, wide-range (2.5 cps—25 kc) Sound and Vibration Analyzer, type 1554-A, with a 10:1 span on each of four ranges, and featuring a ⅓-octave bandwidth (1.26:1), narrow bandwidth (8%, constant with frequency) and all-pass response, is available from General Radio Co. The instrument can be used to measure not only line (single-frequency) components, but also continuous (noise) components.

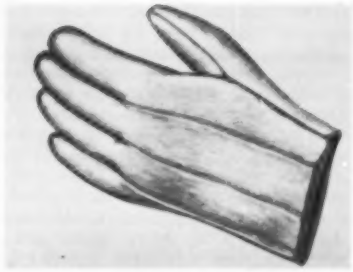
The instrument's narrow bandwidth is wide enough to embrace the small frequency fluctuations (or wow) arising from normal variations in speeds of engines, machines and appliances; 40-db discrimination obtains at one octave from selected frequency. The alternate, ⅓-octave bandwidth is available, for the first time, at low vibration frequencies.

The analyzer is a tunable voltmeter whose bandwidth is a constant percentage of the center frequency. It consists of two *RC*-tuned selective amplifiers, connected in cascade, which can be either synchronously or stagger-tuned to produce narrow or ⅓-octave bandwidths, respectively. Additional instrument features include miniaturized construction with eleven transistors and four subminiature tubes, and shock-mounted amplifier boards. Input to the analyzer can be from a sound level meter, vibration meter or microphone. The analyzer dial can be driven from a G-R Graphic Level Recorder for the automatic analysis of sound spectra.

PRESS SAFETY BLOCK WITH CUT-OFF FEATURE

(Use Key # 574 on Inquiry Card on page 1)

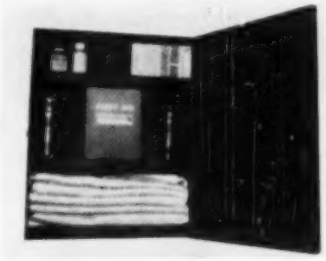
SHOCK-RESISTING magnesium safety blocks, designed to provide maximum safety in metal working press operations, are being offered by Magline, Inc. Constructed of lightweight magnesium alloy for easy handling and dependable strength, the new line of blocks are available in six standard section sizes and are capacity-rated to ultimate load requirements in any specified length. A feature of the new line is the recommended safety power cut-off. When safety block is removed from its controlled storage position for installation in press, power is automatically cut off, providing required safety to worker and equipment.



VINYL GLOVE

(Use Key # 575 on Inquiry Card on page 1)

A VINYL impregnated work glove, designed for longer wear, is available from the Surety Rubber Co. The company claims its Four-To-One gloves outwear cotton and many types of leather gloves by four or more to one. Styled for soft flexing hand comfort and positive gripping action, the gloves are extremely abrasion and snag resistant. Laundering keeps them clean and new looking for the life of the glove.



FIRE EMERGENCY KIT

(Use Key # 576 on Inquiry Card on page 1)

AN EMERGENCY kit, designed to offer protection against small fires, is available from Headlite Products. The kit, packaged in a metal container which can be hung on the walls of small shops, stores, laboratories, boiler rooms, or any convenient location, contains hand-size fire extinguishers, asbestos fire blanket, first aid kit and book, and a pair of bandage shears. Extinguishers are U. L.—approved 2½ lb. dry chemical units, which are suitable for electrical and flammable liquid fires and also small, incipient fires involving paper, fabrics, wood, etc. First aid kit includes burn spray and an assortment of first aid products.

SIX-USE SCAFFOLD

(Use Key # 577 on Inquiry Card on page 1)

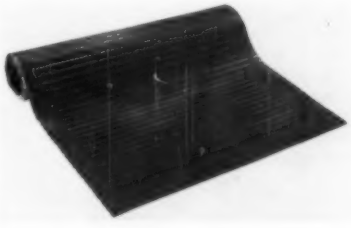
A SCAFFOLD which incorporates six different pieces of equipment is announced by the Atlas Industrial Corp. The Atlas Omni-Reach claims these features: (1) a straight extension ladder; (2) a telescopic scaffold; (3) an adjustable scaffold with large platform; (4) a hanging scaffold; (5) can be an electrically operated scaffold; (6) is a dolly and hand truck.

The equipment, light enough for one man to handle, and able to fit through an ordinary doorway or into an automobile, is made of sturdy aluminum and steel. Unit can be changed from a ladder to a scaffold to a hand truck in a matter of minutes, and is designed for painting, cleaning and all maintenance work.

HIGH GLOSS HARD HATS

(Use Key # 578 on Inquiry Card on page 1)

A HIGHLY-GLOSSED finish is now molded in the Apex line of fibreglass hats and caps, produced by Boyer-Campbell Co. Because the gloss is molded in, rather than added by means of a polish, it is thoroughly impervious to scratches, bumps and weather exposure. In addition, because of the high gloss, the new finish furnishes a more attractive appearance and greater resistance to dirt and stain, and it provides visibility at a greater distance as a result of increased light reflection. The entire line of Apex safety hats and caps, including aluminum, features a unique self-locking polyethylene suspension system which tends to tighten to the hat or cap shell with impact, rather than loosen, providing a new ulimate in wearer safety.



HEAVY DUTY FLOOR MATTING

(Use Key # 579 on Inquiry Card on page 1)

A NEW FLOOR matting, made of Nyracord compound, has been designed by American Mat Corp. for use behind counters, in aisles and wash rooms, etc. Ameritred matting can also be utilized as a traffic director, and to protect carpeting and other floor coverings. The new material is claimed to afford excellent resistance to wear, scoring, denting and puncturing. Both resilient and sound muffling, it is highly slip resistant, wet or dry, and easy to clean.

SELF-POWERED FIRE ALARM

(Use Key # 580 on Inquiry Card on page 1)

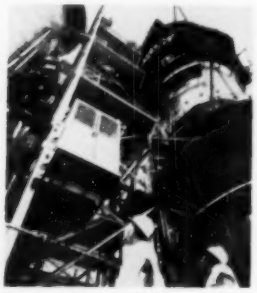
SIMPLE VISUAL inspection and added neatness of design are features of a new series of Freon powered, self-contained Falcon Automatic Fire Detectors manufactured by the Falcon Alarm Co., to give early warning of fire in homes, institutions, commercial buildings and industrial plants. A sight glass has been added to the alarm so that the level of the liquefied gas can be quickly checked at a glance to be sure the unit is fully charged and ready to operate. This eliminates the UL requirement that earlier models be weighed at six month intervals.

The Falcon Detectors, designated as the "S" series, are compact and easy to install with a screw driver; available with temperature ratings of either 136° F or 174° F. When the heat of fire reaches the temperature at which the unit is rated, detector automatically gives a loud, piercing warning audible throughout the protected building and at great distances outside. Installable as individual units or interconnected with tubing to form a system. Both types are approved by Underwriters' Laboratories, Inc.

PORTABLE PERSONNEL ELEVATOR

(Use Key # 581 on Inquiry Card on page 1)

A PORTABLE personnel elevator with traction drive, introduced by the Hawkeye Products Corp., does not require any dead weight suspended on the cable to maintain driving friction. Traction drive eliminates the cable equalizing problems which arise on heights of 250 feet or more in drum winding equipment. The elevator operating on a vertical monorail, made up



of 10-foot sections of "H" beam, has a carrying capacity of eight men or 2000 pounds.

It is simple to set up and operate and can be dismantled, moved to another location and re-assembled in a few hours, making it highly useful in a variety of industrial applications, especially for construction use, eliminating the need for ladders, scaffolds and stairways. The traction equipment consists of a pair of driving drums at the bottom of the monorail column. The second drum is independently adjustable to facilitate cable alignment and equalization. Cable tension is maintained by compression springs which are located on the car and adjusted to give equal cable tension.

The cable equalizer trips a safety locking device should either cable stretch abnormally or break. This positive cam-action brake will stop the elevator, even when fully loaded, within one quarter of an inch; lock may also be engaged by a hand lever installed in the car. Three main bearings and anti-friction guide rollers assure smooth action and prevent jolting when car stops or starts. Other safety devices include a limit switch to prevent over-travel, a governor which automatically stops the car if it overspeeds and a gate control which prevents car movement unless both gates are closed.

FINGER-TIP WRENCHES

(Use Key # 582 on Inquiry Card on page 1)

A WRENCH that enables the user to reach into snug, narrow or remote working areas and secure a nut or bolt in a true position for assembly or disassembly, has been designed by the Beaver Tool Co. The Touch'n Hold tool is worn like a ring, and does not restrict the free motion of hands or fingers; adjustable to fit different size fingers. Company states that considerable research was devoted to the problem of trying to hold a nut with the fingers.

NEW CLEANING SOLVENTS

(Use Key # 583 on Inquiry Card on page 1)

A NEW SERIES of safety cleaning solvents, offered by Harco Chemical Co., is claimed to offer industrial users substantial savings by enabling them to select a formulation meeting their specific cleaning requirements. This eliminates the wasteful use of high cost solvents for routine cleaning. The series of eleven standard formulations ranges from low-cost "wash-up" solvents to high safety factor blends for hazardous locations.

UNIVERSAL-FIT SAFETY GLASSES

(Use Key # 584 on Inquiry Card on page 1)

UNIVERSAL-FIT safety glasses, from Willson Products Div., Ray-O-Vac Co., have a patented bridge design that fits 95% of all faces. It was developed to meet a need in industry for an effective eye-protection program without large inventory and individual fitting by trained personnel. Nose pads and rounded universal bridge distribute the weight of the MonoSpec glasses and assure comfort even with all-day wear. Correctly fitted glasses can be supplied on short notice from a very small inventory to new employees, or as a replacement for a broken pair. This avoids lost production time due to accidents and carelessness. Glasses available with plastic-cable temples or metal spatula temples, and styled for streetwear appearance.

HIGH VOLUME AIR SAMPLER

(Use Key # 585 on Inquiry Card on page 1)

DEVELOPED by the Gelman Instrument Co., the Hurricane Sampler collects dusts and aerosols on special filters which can be analysed to determine concentration of radioactive particles, toxic metals, dusts, etc. Sampler, powered by a motor driven turbine, can be used at sampling rates of up to 100 cfm.

The high volume unit permits sampling of very large quantities of air in order to collect enough toxic material for laboratory analysis. This is especially important in the case of such metals as beryllium, whose allowable concentration is so low that it would take days to collect enough material using standard methods. Unit also has application where delicate industrial components must be installed in dust-free areas.

The Hurricane Sampler is supplied with flowmeter to indicate flow of air. Motor is independently cooled so that there is no danger of burnout if the filter becomes heavily loaded and air flow is reduced. Heavy duty carbon brushes are easily removed or replaced without dismantling sampler.

4-SIDED PORTABLE SCREEN

(Use Key # 586 on Inquiry Card on page 1)

A FOUR-SIDED portable screen, for use in the welding industry and other fields, is available from Singer Glove Mfg. Co. Called the Four-some, it affords complete enclosure of the job. Made of rust proofed tubular steel, the screen's slip-joint construction makes assembly a fast, easy job. The 6 ft. screen weighs only 85 lbs., folds for storage or removal to new location, and is available with heavy-duty rubber

wheel casters for use where greater mobility is necessary.

The curtain itself is offered in a choice of 3 materials: standard 12 oz. duck, neoprene-coated fiber glass and Johns-Manville aluminized asbestos. This last material is claimed to offer the maximum in protection against radiant heat because it protects by reflection.

DISPOSABLE SPLINTS AVAILABLE FOR EMERGENCIES

(Use Key # 587 on Inquiry Card on page 1)

A NEW CONCEPT in emergency splinting, for the first aid worker has been announced by Hartmann Safety Products. Available in three sizes to accommodate arms, legs, hips or pelvis, the Hartmann Disposable Splint eliminates expensive replacement costs, requires no triangular bandages and enables one person to do the job. The splint is constructed of a special white corrugated board with attached muslin ties. It is tapered and

scored to conform to the contour of the fractured limb and its construction permits x-ray of fractures without removal of the splint.

ELECTRONIC SECURITY SYSTEM

(Use Key # 588 on Inquiry Card on page 1)

A NETWORK of remotely-located electronic detection devices controlled by a master panel is claimed by its maker, the Minneapolis-Honeywell Regulator Co., to offer 100 per cent detection of fires or entry by unauthorized persons for an entire building, even if extended over several acres with many entrances.

The system, utilizing only one person, seated at a master control center, integrates a number of devices, such as sound and motion detectors, closed circuit TV, two-way intercommunication units, temperature actuated fire alarms, electronic fencing, etc.

When any type of security violation occurs, the guard receives both an audible and visual signal. Sub-system panels indicate at a glance the particular area in which the emergency exists. Should the guard himself become incapacitated, a built-in safeguard automatically alerts police headquarters. The company estimates that the system can reduce industry's expenses for plant protection by 40 per cent.

SPARK ARRESTOR

(Use Key # 589 on Inquiry Card on page 1)

A COMPACT Gill Spark Arrestor for gas or diesel engines using a four-inch exhaust stack is available from Erickson Products Co. It is primarily designed for large trucks, tractors, loaders and other equipment used in forests, fields, brush and other hazardous areas where incan-

descent exhaust carbon can start fires.

By trapping almost 100 per cent of the exhaust carbon from the engine at every throttle position, having provision for easy removal of the collected carbon, and good durability, this spark arrestor is reported to exceed all test requirements of the U. S. Forest Service.

PROXIMITY ALARM

(Use Key # 590 on Inquiry Card on page 1)

MOSLER Safe Co. claims complete alarm protection for safes, filing cabinets, etc., through their Model "400," the first all-transistor system approved by the Underwriters' Laboratories. This system has never been defeated and affords protection against all forms of burglarious attacks including the torch. It creates an invisible harmless electronic field all around the safe. When the field is entered, a special battery-powered outside bell is activated. Entire system is battery-operated and independent of electric power failure. Flexibility allows for connection into either conventional premise alarm or daytime holdup equipment.

WARNING FLASHERS

(Use Key # 591 on Inquiry Card on page 1)

THE NRB Flashmasters series, announced by Carpenter Mfg. Co. for heavy-duty applications, are said to couple high output with great economy of operation. The flashers are available with either 2-way 4" lenses or a 360-degree fresnel dome. The lamp is a special neon coil which, it is claimed, will give thousands of hours of service. Continuous operating life of the units is well in excess of two

years. They use any standard 6-volt lantern battery; and the battery-life (under continuous 24-hour operation) averages 8 weeks. Hardy construction features an 18-gauge drawn steel case and a separate, sealed and shock-mounted inner case protecting the mechanism.

VEHICLE BATTERY SWITCH

(Use Key # 592 on Inquiry Card on page 1)

A BATTERY SWITCH which provides the same year round protection in a car as the master current switch does in a home, has been introduced by the A. L. Rogers Development Corp. Called the Auto-Gard, the device enables a driver to cut off all current in his car or truck, thereby eliminating such common "live wire" dangers as fires, short circuits, smoking wires and continuous horn blowing.

Easily installed near the car battery, the UL-approved switch can be operated from the dashboard or from the glove

compartment by means of an extension cable and control button supplied with each unit. With the current completely off and the control button safely locked in the glove compartment, the parked car, taxi-cab or truck is safeguarded against theft. More important, children who tamper with car controls cannot accidentally start the motor.

The Auto-Gard also protects the do-it-yourself repair man from shocks or burns caused by live wires, since turning off the ignition in itself does not cut off the battery current.

EYESHADE SPECTACLE

(Use Key # 593 on Inquiry Card on page 1)

ELIMINATION of overhead glare, combined with style and comfort, makes the Eyeshade Spec suitable for eye protection where overhead lighting creates an additional problem. Introduced by the United States Safety Service Co., the spectacle adequately shades the eyes from above while the one-piece optical plastic lens gives full protection from impact. Both the regular and sideshield models have one-piece lenses which can be easily replaced without tools.

On the sideshield models, the shields are an integral part of the lens, curving around the face to afford suitable side protection. The self-adjusting nose piece is soft and comfortable. Regular lenses as well as sideshield lenses are furnished in either clear or medium green. The unit is designed to meet rigid Federal Specifications for optical qualities and impact resistance.

SAFETY PLUNGER CAN

(Use Key # 594 on Inquiry Card on page 1)

A NEW safety plunger can, approved by Factory Mutual for dispensing flammable or volatile liquids, has been introduced by Eagle Manufacturing Co. Close control of flammable liquid is possible with the can. Pressing down on a spring-mounted dasher forces a measured amount of the fluid to rise and dampen a sponge or cloth. Moistening the cleaning swab is done easily with one hand. Dangerous evaporation loss is reduced in operation of the plunger can, and a preforated metal screen in the dasher acts as a fire baffle against ignition of the contents.

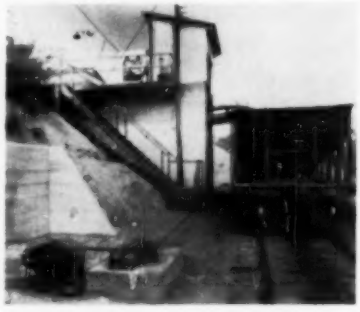
Constructed of one-piece, 24-gauge terne coated steel, the product is built for long, reliable use. It has a seamless body, and top and body are electrically welded under electronic control. Available in 1 quart, 2 quart, and 1 gallon capacities.

FILM-BADGE SERVICE FOR SENSITIVE MONITORING

(Use Key # 595 on Inquiry Card on page 1)

IN VIEW of the new lowered radiation dose limits recommended by the National Committee on Radiation Protection, Nuclear-Chicago Corp. has improved its film-badge service by going to a new sensitive film which permits accurate reporting of doses as low as one milliroentgen.

Reporting of the low doses also marks the start of a new IBM computing system. Customer radiation statements now include badge reports for current periods, accumulated reports for a thirteen-week period and for the year to date. This method of reporting will save tallying-time for subscribers and will make it convenient for those who have to keep reports for governmental bodies.



SAFETY CAR PULLER

(Use Key # 596 on Inquiry Card on page 1)

WITH THE No. 14H wire rope Car Puller, developed by Stephens-Adamson engineers, there are no ropes to snub. The wire rope dead ends directly into the drum. A heavy duty clutch operated by a hand wheel permits drum to be released and turn freely in paying out rope. The clutch is easily engaged to start and pull a rated load.

Unlike other car pullers, the operator does not have to maintain tension or coil rope. The car puller is totally enclosed, fully protecting the operator from moving parts. The unit is weather-tight and requires no special housing.

DUSTLESS DRILLING SYSTEM

(Use Key # 597 on Inquiry Card on page 1)

A DUST COLLECTING system for use with hand held sinker drills is offered by Le Roi Div. of Westinghouse Air Brake Co. It can be used with any brand of rock drills. Dust and cuttings are trapped by a collar that fits around the drill steel and are "inhaled" through a connecting hose to a Le Roi DK280 dust collecting tank.

The system eliminates dust as a health hazard, increases air tool operator efficiency, and is a public relations factor in residential or pedestrian areas. Dust collecting tank can be mounted on any compressor carrying truck or portable compressor. Also used in coal and ore mine drilling, the DK280 has a large drawer that pulls out easily for disposal of dust and cuttings.

CONDUCTIVE TRANSPARENT COATINGS

(Use Key # 598 on Inquiry Card on page 1)

METHODS of producing electrically conductive transparent coatings by vacuum deposition of certain materials have been developed by National Research Corp. Potential applications include defogging of windows and ports in transportation vehicles such as aircraft, railroad cars and automobiles and other installations where a heated transparent surface may be desirable.

Typical properties of the experimental coatings include 75 per cent transmission of visible light, resistance of 15 ohms per square and stability over long periods between —50°F and +200°F. The coatings are normally used as a "sandwich" laminate for maximum protection and durability and have been applied to both plastics and glass.

TOILET BOWL CLEANER IN DISSOLVING PACKAGE

(Use Key # 599 on Inquiry Card on page 1)

A NEW toilet bowl cleaner-disinfectant, named First Glo-Bol, is contained in a transparent, water-soluble package which, when dropped unopened into the bowl, dissolves in seconds to release the cleaner's chemicals into the water. Developed by Platt & Smillie Chemicals, Inc., the product is reported to effect a high detergency. It contains buffering agents, deodorant, odorless disinfectant, and a light, pleasant fragrance.

Colloids of the dissolving film packet enclose soils and encrustation flakes loosened by the Glo-Bol chemicals, preventing redeposition in bowl, trap or sewer line. Prepackaged proportion control is said to eliminate guesswork in measuring and application, thus offering greater economy to the user.

"SAFETY MAINTENANCE"
MAGAZINE

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NEW YORK 38, N. Y.

SEMI-ANNUAL INDEX

VOLUME 118 JULY–DECEMBER, 1959

EDITORIALS

Safety Briefing—Top to Bottom ..... Aug. 4
The Toll of Falls ..... Aug. 4
The O'Leary Cow ..... Sept. 4
Neon Lighted Jungles ..... Oct. 8
The Country's Largest Safety Exhibit ..... Oct. 8
Brush-Off From the Throne ..... Nov. 4
When Is an Accident Report? ..... Dec. 4

ACCIDENT PREVENTION

Accident Causes ..... July 25; Sept. 9; Dec. 11
Accident Rates ..... Aug. 14; Oct. 14
The Blind Shouldn't Drive ..... Sept. 31
Busway System De-Shocks Electricity ..... Sept. 26
Detect Defects With Sound ..... July 21
Do-It-Yourself Guarding—Allen J. Cobb ... Sept. 10
Do We All Measure Accident Frequency Correctly?—
Robert M. Anderson ..... Aug. 14
The Downfall of the Accident Cycle—
Edward E. Zane ..... Dec. 11
Electrical Safety ..... Sept. 26; Dec. 19
Eye Protection ..... Aug. 7, 18; Sept. 22;
Oct. 34; Nov. 7, 16
A Glove Program With a Safety Grip—
Thomas H. Bullard ..... Aug. 10
Good Housekeeping: Key to Better Safety—
Robert J. White ..... Aug. 9
Guards ..... Sept. 10; Oct. 26; Nov. 20; Dec. 22, 54
How Does Your Plant Safety-Rate? ..... Oct. 14
How Good Are Synthetic Fiber Ropes? ..... Oct. 20
How to Smash Accidents To a Pulp ..... July 10
Hazardous Materials ... July 9, 10; Aug. 17;
Sept. 18; Oct. 17; Dec. 39
Insulated Clothing Keeps Employees Defrosted . Dec. 17
Is There a Hole In Your Safety Program? .. Oct. 13
Keeping Up With Machine Guard
Developments ..... Dec. 54
Keeping Up With Safety Clothing
Developments ..... Sept. 50
Labor's View of Eye Safety—
George T. Brown ..... Aug. 7
Ladder Safety Device ..... Oct. 16
Maintenance Accidents ..... Nov. 12
Microwave Radiation Hazards—
W. E. Morgan ..... July 16
Materials Handling ..... Sept. 13; Oct. 20; Dec. 18
National Safety Congress—Preview of the
Sixties ..... Dec. 33
Palletize the Pipe ..... Sept. 13
Plastic Gangway Lines ..... July 20
The Principles of Machine Guarding ..... Oct. 26
Protection Against Hot Liquids—
W. W. Story ..... July 9
Pulp and Paper Industry Safety ..... July 10
Roof Bolts Increase Safety In Aqueduct
Tunnel ..... Nov. 15
Safety Clothing ..... July 7, 9; Aug. 10;
Sept. 50; Dec. 17
Safety Equipment ..... July 10; Nov. 13
Safety Equipment for Handling Antimony
Trichloride ..... Aug. 17
Safety Equipment for Handling Cyclohexane .. Dec. 39
Safety Equipment for Handling Hydrocyanic
Acid ..... Oct. 17
Safety Equipment for Handling Phthalic
Anhydride ..... Sept. 18
Safety Gloves ..... Aug. 10; Sept. 50
Safety Hats ..... July 22
Safety in Trees—Ross J. McCafferty ..... July 14
Safety Programs ..... Oct. 13; Dec. 11
Safety Shoes ..... Sept. 20; Oct. 11; Dec. 28
Search For Safer Solvents ..... July 19
Sight Saving In the Small Plant—
Dr. William L. Roberts ..... Nov. 7
Spot Accidents in Advance ..... July 25
Steps to Safety—James E. Bly ..... Oct. 23
Techniques of Mechanical Guarding .. Nov. 20; Dec. 22
Too Many Accidents Among Unskilled
Workers ..... Sept. 9
Vision Program ..... Sept. 31; Oct. 37
Who's Your Safety Tailor? ..... July 7
A Workable Safety Shoe Program ..... Oct. 11

MAINTENANCE

Automatic Snow Removal ..... Dec. 29
Battery Maintenance ..... Dec. 19
Boiler Soot Gets the Vacuum Treatment ... July 23
Floor Maintenance ... July 15; Aug. 21;
Sept. 21; Oct. 23; Nov. 10, 17; Dec. 14
Good Housekeeping & Safety ..... Aug. 9
How to Maintain Conductive Floors—
J. L. Brenn ..... Nov. 17
How Poor Maintenance Ruins Magnesite .... July 15
How Poor Maintenance Ruins Marble ..... Sept. 21
How Poor Maintenance Ruins Quarry Tile ... Aug. 21
How to Prevent Maintenance Accidents—
W. C. Cooley ..... Nov. 12
How to Set Up an Effective Lubrication
Program—J. H. Fuller ..... Sept. 15
Keeping Up With Plant Maintenance
Developments ..... July 52
Lubrication Classroom on Wheels ..... Aug. 19
Lubrication Program ..... Sept. 15
Plant Maintenance ..... July 52
Resurfacing Compounds For Industrial Floors—
J. B. Calkin & W. R. Crandall ... Nov. 10; Dec. 14
Safety Tips for Battery Maintenance ..... Dec. 19
Solvents ..... July 19
Stair Tread Maintenance ..... Oct. 23
Ultrasonic Flaw Detectors ..... July 21

INDUSTRIAL HYGIENE

Air Pollution ..... July 41; Oct. 24
Analyzer Checks Gas Purity ..... Aug. 45
Approved Methods of Artificial Respiration .. Sept. 34
Are Torching Fumes Toxic? ..... Aug. 46
Artificial Respiration ..... Sept. 34
Basics of Noise Control ..... July 32
Can Eyes Meet Job Requirements? ..... Oct. 37
Concrete As a Fallout Shield ..... Sept. 39
Conductive Floors ..... Nov. 17
Dust & Fume Control ..... Aug. 45, 46;
Oct. 24, 41; Nov. 19, 45; Dec. 36, 47
Eliminate Truck Fumes ..... Nov. 45
Eye-Wash Fountains ..... Oct. 34
First Aid for Chemical Injuries—
James E. Traynor ..... Oct. 34
First Aid Products ..... Nov. 48
Five Dust & Fume Problems—And How They
Were Solved ..... Dec. 36
Keeping Up With First Aid Developments ... Nov. 48
Keeping Up With Noise Control
Developments ..... Aug. 48
Microwave Radiation Hazards ..... July 16
Mouth-to-Mouth Resuscitation ..... Sept. 34
Noise Analysis & Control ..... July 32; Aug. 48
Radiation Safety ..... Aug. 22; Sept. 39
Testing the Air Underground ..... Oct. 41
Vapor Incinerator Burns Up Air Pollutants ... July 41

FIRE PROTECTION

Conductive Floors ..... Nov. 17
Grating Aids Fire Protection ..... July 49
A Fire Defense in Depth—W. W. Story ..... Sept. 44
Fire Equipment Maintenance ..... Aug. 32
Fire Fighting Equipment ... July 51; Aug. 32;
Sept. 44; Oct. 56, 58; Nov. 32; Dec. 48
Fire Hazards ..... July 51; Sept. 42; Nov. 32
Fire Losses Off the Job Mean Fire Losses
On the Job ..... Oct. 56
Fire Training ..... July 51; Sept. 44
Flammable Liquids ..... Sept. 42
Increased Hazards—Increased Fire
Protection ..... Nov. 32
Keeping Up With Fire Protection
Developments ..... Oct. 58
Kitchen Exhaust Systems ..... Dec. 47
Plastic Panels Withstand Explosion ..... Nov. 35
Protection of Flammable Liquids ..... Sept. 42
Pumping a Blanket to Smother Fire ..... Dec. 48
Three Fire Protection Tips ..... July 51
Will Dacron Hose Meet the "Use" Test? ... Aug. 35
Will Your Sprinkler System Work? ..... Aug. 32

SPECIAL DEPARTMENTS

Achievements & Awards ... July 42; Aug. 54;
Sept. 59; Oct. 46; Nov. 42; Dec. 58
Another Accident Checked ..... July 12;
Aug. 18; Sept. 20; Oct. 16; Nov. 16; Dec. 28
Bulletins & Catalogs ... July 1; Aug. 1;
Sept. 1; Oct. 71; Nov. 1; Dec. 1
The Fire Front ..... July 47; Aug. 31;
Sept. 41; Oct. 55; Nov. 31; Dec. 45
The Future Shows ..... July 63; Aug. 6;
Sept. 6; Oct. 25; Nov. 6; Dec. 10
Industrial Hygiene News ..... July 31;
Aug. 43; Sept. 33; Oct. 32; Nov. 44; Dec. 35
Inside the Trade ..... July 62; Aug. 59;
Sept. 61; Oct. 68; Nov. 57; Dec. 60
Learning the Hard Way ..... Oct. 44; Nov. 55
"Safety Maintenance" Salutes a Safety
Idea ..... July 20; Aug. 22; Sept. 22;
Oct. 24; Nov. 19; Dec. 18
Safety On Film ..... July 46; Nov. 41
The Safety Shelf ..... July 60; Aug. 27;
Sept. 48; Oct. 50; Nov. 37; Dec. 43
Transportation Safety ..... Aug. 37; Sept. 30
What's the Law? ..... July 29; Aug. 23;
Sept. 24; Oct. 45; Nov. 26; Dec. 31
What's New? ..... July 64; Aug. 60;
Sept. 24; Oct. 69 Nov. 59; Dec. 61

NEW PRODUCTS AND RECENT DEVELOPMENTS

Acoustical Absorber, Portable ..... Aug. 49
Acoustical Tile ..... Aug. 50
Acoustical Tile, Fire-Guard ..... Aug. 48
Air Monitor, Mobile ..... Oct. 75
Alarm, Breathing Apparatus ..... Oct. 73
Alarm, Vehicle Back-Up ..... Dec. 62
Aluminized Fabric, Improved ..... Sept. 51
Audio-Analyzer ..... Dec. 62
Audiometer, Tone & Speech ..... Aug. 51
Bandage Dressing, Non-Sticking ..... Nov. 54
Bandage, Pressure ..... Nov. 50
Bandage, Sprayed-On ..... Nov. 48
Blast Recorder ..... Sept. 64
Boot, Air-Conditioned ..... Sept. 57
Boot, Fireman's Safety Toe ..... Oct. 59
Broom, Asphalt Sealer ..... Oct. 70
Buckets, Shatterproof ..... Dec. 61
Cart, Waste & Cleaning ..... July 56
Clamp, Lifting ..... Sept. 63
Cleaner, Aluminum ..... Oct. 69
Cleaner, Germicidal ..... July 56
Cleaner, Germicidal Bowl ..... July 58
Cleaner, Germicidal-Deodorizing ..... Oct. 74
Cleaner Liquid, Steam ..... July 53
Cleaner, Sanitizing ..... July 54
Cleaners, Ultrasonic, Multi-Purpose ..... July 66
Cleaner, Ultrasonic, Truck-Mounted ..... Oct. 74
Cleaning of Electrical Equipment ..... July 54
Clothing, Chemical, Anti-Static ..... Sept. 56
Clothing, Chemical, Lightweight ..... Sept. 55
Clothing, Disposable ..... Aug. 60
Clothing, Fire Fighting Suit ..... Oct. 64
Clothing, Fire Suit ..... Sept. 51
Clothing, Freezer, Lightweight ..... Sept. 54
Clothing, Heat Resistant ..... Sept. 54
Clothing, Protective, Disposable ..... Sept. 54
Clothing, Welder's, Lightweight ..... Sept. 50
Clothing, Work, Anti-Static ..... Sept. 54
Coat, Laboratory, Static-Free ..... Sept. 51
Coat, Rain, Lightweight ..... Sept. 52
Coating, Aluminized ..... July 55
Coating, Asphalt-Aluminum ..... Oct. 74
Coating, Neoprene Maintenance ..... July 54
Combustion Safeguard, Gas-Burner ..... Aug. 62
Concrete Curing Sprayer ..... July 58
Controller, Solution, Electronic ..... Dec. 56
Coolant Unit, Mist ..... Aug. 62
Cot, Ambulance, Roll-In ..... Sept. 65
Cot, One-Man ..... July 65
Cot, With Chair Back ..... Nov. 52
Covers, Spiral, Shaft ..... Dec. 55
Deodorizer, Odorless ..... July 64
Detector, Toxic Gases ..... July 68
Detergent, Germicidal ..... Oct. 75
Disinfectant, Aerosol ..... Aug. 64
Disinfectant-Deodorant, Aerosol ..... Sept. 63
Display Unit, Illuminated ..... Sept. 66
Dock Plate, Lightweight ..... Sept. 66
Door, Bumper ..... Dec. 62
Door Opener, Emergency ..... Oct. 73
Dosimeter System, Radiation ..... Sept. 63
Ear Protector, Head-Set ..... Aug. 53
Ear Protectors, Muff Type ..... Aug. 48
Ear Protectors, Flexible Plastic ..... Aug. 49
Ear Protector, Noise ..... Aug. 48
Ear Protectors, Noise Controlling ..... Aug. 52
Ear Protector Set ..... Aug. 52
Ear Valve, Improved ..... Aug. 50
Earphone ..... Aug. 51
Electrical Trolley ..... July 65
Electric Safety Lock ..... Oct. 75
Extinguishers, Dry Chemical Portable ..... Oct. 61
Extinguisher, Dry Powder ..... Oct. 59
Extinguisher Hose-Horn Kit ..... Dec. 64
Extinguisher, Improved Pump ..... Oct. 62
Extinguishers, Pressure Energized .. Sept. 66; Oct. 58
Extinguisher, Pressurized Dry Chemical ..... Oct. 62
Extinguisher, Small Area ..... Oct. 59
Extinguisher, Spherical ..... Oct. 64
Extinguishers, Two Portable ..... July 67; Oct. 64
Extinguisher Hoses & Nozzles ..... Aug. 65
Eye-Rinse Bottle ..... July 65; Nov. 52
Eye-Wash Wall Fountain ..... Aug. 64; Nov. 49
Fabric, Lead Vinyl ..... Sept. 56
Face Shield With Head & Chin Guard ..... Dec. 62
Fanners, Sheet Feeding ..... Dec. 55
File Safety Handles ..... Dec. 65
Film Badge Service ..... July 66
Filter, Air, Parabolic ..... Aug. 62
Filter, Water Sterilizing ..... Dec. 64
Finger Guard, Seamless ..... Aug. 63
Fire Alarm, Modernized ..... Oct. 62
Fire Alarm, Non-Electric ..... Dec. 63
Fire Detector-Alarm Kit ..... Sept. 64
Fire Escape, Portable ..... July 67
Fire Helmet & Shield ..... Sept. 51
Fire Hose, Bonded Dacron ..... Oct. 62
Fire Hose Cabinet ..... Oct. 60
Fire Preventing Emulsion for Oil ..... Dec. 64
Fire Pump, Portable ..... Dec. 63

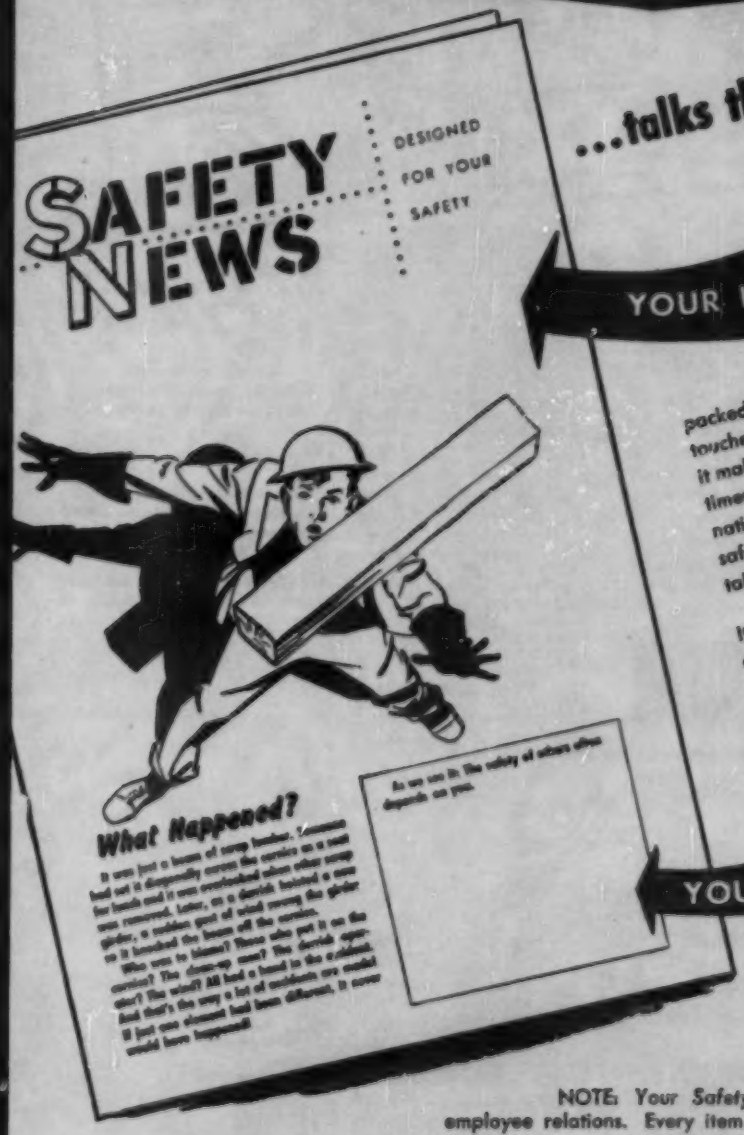
Fire Resistant Fluids, Hydraulic ..... Oct. 63
Fire Resistant Hydraulic Fluid ..... July 66; Oct. 60
Fire Retardant Coating ..... July 68
First Aid Kit, Boat-Use ..... Nov. 53
First Aid Kit, Burn ..... Nov. 52
First Aid Kits, Marine ..... Oct. 69
First Aid Kit, Travelers ..... Aug. 61; Nov. 50
First Aid Kits, Unit Type ..... Nov. 53
First Aid Kit with Window ..... Nov. 50
First Aid Spray ..... Nov. 51
First Aid Station, Chemical Burn ..... Nov. 53
Flammable Liquids Faucet ..... Oct. 64
Flasher, High Speed ..... Oct. 74
Floor Absorbent, Non-Combustible ..... Aug. 63
Floor Coating, Non-Slip Roll-On ..... Aug. 60
Floor Decking, Non-Slip Waterproof ..... Aug. 64
Floor Enamel, Concrete ..... July 52
Floor Machine, Battery Powered ..... Oct. 75
Floor Machine Line ..... Aug. 64
Floor Machine, New ..... Sept. 66
Floor Paint Ingredient, Non-Slip ..... Oct. 70
Floor Patch, Latex-Cement ..... Sept. 67
Floor Scrubbing Pad, Reusable ..... Oct. 70
Floor Slipperiness Tester ..... July 64
Floor Sweeper & Cloth ..... Aug. 64
Floor Topping, Chemical Resistant ..... Aug. 62
Foot Protector, Instep ..... Sept. 53
Footsprayer, Athlete's Foot ..... Oct. 73
Glare & Heat Reducers ..... Sept. 67
Gloves, Chemical, Aluminized ..... Dec. 64
Gloves, Cotton, Long Wear ..... Sept. 57
Gloves, Custom-Made ..... Sept. 52
Gloves, Heavy-Duty Neoprene ..... Sept. 53
Gloves, Leather, Four Types ..... Sept. 53
Glove, Lineman's Two-Color ..... July 65; Sept. 50
Gloves, Neoprene ..... Sept. 54
Gloves, Non-Slip Plastic ..... July 67
Gloves, Plastic, Disposable ..... Oct. 70
Gloves, Reversible Mitt ..... Oct. 75
Gloves, Rough Surface ..... Sept. 54
Gloves, Solvent Resistant ..... Oct. 74
Gloves, Vinyl ..... Sept. 56
Gloves, Vinyl Impregnated ..... Sept. 57
Gloves, Welder's ..... Sept. 56
Gloves, Welder's, Reversible ..... Sept. 55
Goggle-Respirator, Full-Face ..... Aug. 63
Goggles, Easy-Fit Spectacles ..... Oct. 75
Goggles, Spectacles with Side Shields ..... Oct. 69
Goggle Temple Hooks ..... Aug. 65
Grating, Corrosion Resistant ..... Dec. 65
Grating, Non-Skid ..... Oct. 70
Grounding Device for Wire Stringing ..... Aug. 61
Guard, Conveyor Overload ..... Dec. 57
Guard, Electrical, For Mine Machines ..... Aug. 65
Guard, Crane Boom ..... Dec. 56
Guard, Curtain of Light ..... Dec. 54
Guard, Hoist Overload ..... Dec. 56
Guard, Pull-Back ..... July 66; Dec. 55
Headgear, Three-Way ..... Aug. 65
Hearing Aid, Sunlight Powered ..... Aug. 53
Hood, Rain, Ventilated ..... July 67; Sept. 55
Ice Melter, Improved ..... Dec. 65
Ice Melting Chemical ..... Oct. 74
Incinerator, Six-Bushel ..... July 55
Ladder Leveler, Automatic ..... July 53
Ladder Leveler, Self-Adjusting ..... Dec. 62
Ladders, Safety ..... July 54
Ladder, Upright With Safety Treads ..... July 56
Leak Plug, Water ..... July 53
Light-Beacon, Revolving ..... July 68
Light, Hand, Explosion-Proof ..... Dec. 63
Magnet Chain Assemblies ..... Oct. 73
Mask Control, Air Demand ..... Sept. 64
Medical Medallion ..... Nov. 49
Medication, Intestinal Flora Stabilizer ..... Nov. 50
Meter, Noise, Pocket Size ..... Aug. 52
Meter, Sound Level ..... Aug. 50
Mixer, Rotary ..... Oct. 69
Mobile Work-Shop ..... July 53
Noise Absorbing Pipe Sections ..... Aug. 52
Oilers, Pump ..... Dec. 64
Noise Source ..... Aug. 51
Oxygen Kit, Breathing Protector ..... Nov. 54
Oxygen Kit, Emergency ..... Nov. 52
Oxygen Kit, Portable ..... Nov. 48
Oxygen Therapy Regulator ..... Oct. 74
Oxygen Unit, Emergency ..... Nov. 49
Paints, Aerosol Color-Coding ..... Aug. 64
Paint, Fire Resistant ..... Oct. 63
Paint, Fire Retardant ..... Sept. 65
Paint, Fire Retardant Coating ..... Oct. 58
Paints, Fluorescent, Safety ..... Aug. 61
Paint, Fluorescent Warning ..... Sept. 65
Paint, Insecticidal Alkyd ..... Dec. 61
Paint Colorants ..... July 55
Partitions, Expanded Metal ..... Dec. 57
Pipe Hangers ..... Oct. 60
Poison Ivy Cream ..... Nov. 52
Press Back Gauge ..... Dec. 54
Press Transfer System, Magnetic ..... Dec. 56
Press Unloader, Automatic ..... Dec. 55
Puncture Plates for Storage Tanks ..... Oct. 61
Recorder, Air Sampling ..... Dec. 61
Respirator Filter, Micro-Fiber ..... July 68
Resurfacer, Chuck-Hole Filler ..... Dec. 63
Resuscitating Tube, Mouth-to-Mouth ..... Aug. 62; Nov. 52
Resuscitation Airway Tube ..... Nov. 48
Resuscitator, Mouth-to-Mask ..... Nov. 50
Resuscitator Unit, Versatile ..... Dec. 65
Roof Cement, Glass Fibre ..... July 58
Roof Coating, Aluminized ..... Aug. 61
Roof Coating, Aluminum-Asphalt ..... July 54
Rust Preventive ..... July 57
Rust Preventive, Non-Flammable ..... Aug. 61
Safety Cans, Bench & Drip ..... Oct. 59
Safety Cap, Lightweight ..... Sept. 56
Safety Shoe, Chukka Style ..... Sept. 52
Safety Shoe, Moccasin ..... Sept. 50
Safety Shoes, Molded ..... Aug. 61
Safety Shoe, Women's Ripple Sole ..... July 65
Safety Shoe Service, Vehicle ..... Sept. 56
Salt Tablets, Pre-Packaged ..... Nov. 49
Sanitizer, Dust Control ..... Sept. 66
Scaffold, All-Purpose ..... July 57
Scaffold, Aluminum All-Purpose ..... July 52
Scaffold, Automatic Maintenance ..... July 57
Scaffold, Magnesium ..... July 56
Scaffolding, Heavy-Duty ..... Dec. 62
Screen, Portable Aluminized ..... Aug. 60
Sealer, Black Top ..... Sept. 64
Shield, Portable ..... Oct. 69
Shoe Coverings, Disposable ..... Dec. 63
Shoe Insoles, Equalizer ..... Sept. 57
Shoe Tester, Conductive ..... Dec. 65
Signal Horn, Versatile ..... Sept. 67
Signs, Reflective ..... Oct. 73
Signs, Warning, Self-Sticking ..... Sept. 67
Silencer, Improved, Air-Noise ..... Aug. 52
Silencer, Snort Valve ..... Aug. 49
Silencers & Snubbers ..... Aug. 53
Siren & Amplifier ..... Oct. 60
Skin Lotion, Protective ..... Aug. 65
Sling Chain Release, Solenoid ..... Sept. 65
Slings, Plastic Coated Wire Mesh ..... Sept. 66
Solvent-Detergent ..... July 67
Sound Barrier ..... Aug. 51
Sound Room ..... Aug. 50
Stretcher, Lightweight Folding ..... Aug. 61; Nov. 50
Sweeper, Power, Dust-Controlling ..... Aug. 60
Tape, Pipe Sealant ..... July 56
Telephone Booth, Acoustical ..... Aug. 49
Temperature Control Automatic ..... July 65
Tester, Chain & Cable ..... Sept. 66
Tester, Hazardous Vapors ..... Oct. 64
Treads, Aluminum Safety ..... July 64
Trucks, Explosion-Proof ..... July 68
Truck, Spark-Protected ..... Aug. 63
Truck Vacuum Lifter ..... Sept. 63
Vacuum Cleaner, Vibrating ..... Sept. 64
Vacuum Cleaners, Wet & Dry ..... Dec. 65
Vacuum, Germ Filtering ..... Dec. 63
Vacuum-Scrubber, Battery Powered ..... Sept. 65
Vacuum System, Central ..... Aug. 63
Vehicle Switch, Fire Preventing ..... July 64
Warning Light, Flashing ..... Dec. 61
Washer, Waste Can ..... Oct. 70
Welding Exhaust System ..... Sept. 67
Wind Component Recorder ..... Oct. 73
Winter Liners ..... Sept. 52

Index to Advertisers and their Agencies

American LaFrance Corp.	Inside Back Cover	*Barlow Advertising Agency, Inc., Syracuse*
Bradley Washfountain Co.	5	*Kirkgasser-Drew, Chicago*
Carbisulphoil Co.	57	*Tracey-Locke Co., Inc., Dallas*
Carpenter Mfg. Co.	39	*Albert-Frank Guenther Law, Inc., Boston*
Cover, H. S.	35	*MacDonald-Cook Co., South Bend*
Detex Watchclock Corp.	18	*J. M. Kesslinger & Associates, Newark*
Hood Rubber Co.	30	*Griswold Eshleman Co., Cleveland*
Hynson, Westcott & Dunning, Inc.	Back Cover	
Legge Co., Walter G.	31	*J. M. Kesslinger & Associates, Newark*
Meyer Machine Co., Inc.	53	*Wm. L. Baxter Advertising, Minneapolis*
Osborn Mfg. Co.	57	*Tri-State Advertising Co., Inc., Warsaw*
Practical Mfg. Co.	37	*B. E. Fischbein & Associates, Inc., Minneapolis*
Quabaug Rubber Co.	Inside Front Cover	
Rose Mfg. Co.	23	*Harold Walter Clark, Inc., Denver*
Safety Clothing & Equipment Co.	21	*Carpenter Advertising Co., Cleveland*
Sigma Engineering Corp.	53	*Ross Advertising Agency, St. Louis*
Union Asbestos & Rubber Co.	6	*Biddle Co., Bloomington*
Wagner Sign Service	25	*Wendt Advertising Agency, Toledo*
Watchemoket Optical Co., Inc.	38	*Darrell Prutzman Associates, Providence*
Wilkins Co., Inc.	40	*Laux Advertising, Inc., Ithaca*
Williams Jewelry & Mfg. Co.	51	*Vernon S. Weiler, Chicago*

SEND THIS PERSONAL SAFETY MESSAGE TO EVERY ONE OF YOUR EMPLOYEES.

- Safety is made appealling . . . vivid . . . engaging . . . colorful!
- Each worker clearly sees how safety benefits him . . . how doing his part helps others!
- You get enthusiastic safety cooperation instead of tolerance . . . from every employee . . . every month!



. . . talks the worker's language!

YOUR IMPRINT HERE!

packed with pictures, alive with animated cartoons, touched with humour that gives snap to your message, it makes safety interesting and down to earth. Twelve times a year it covers accident hazards. Across the nation leading industrial firms state it's the only safety paper their employees will read . . . and take home to their families.

It gives the employer the advantages of personal contact . . . saves time and expense. One "lost time" accident prevented . . . more than pays for the yearly cost! Try it . . . it works!

YOUR SIGNATURE HERE!

Make Your Safety News your own publication . . . your good will ambassador . . . working for you toward better industrial relations. If you wish, your facsimile signature can be printed here to identify you with the message that gets next to your men and boosts morale.

NOTE: *Your Safety News* is designed to promote better employer-employee relations. Every item is carefully weighed and tailored to this viewpoint!

INSIDE PAGES
(Pages 2 and 3)

THOUGHTLESSNESS IS A THIEF
He'll steal his way into what you're doing, distract your attention and walk off with a finger, arm, eye or foot. Thoughtlessness takes many forms: it may be daydreaming, or worry about some personal problem, or just plain inattention. Anything that distracts you, especially around machinery, is a thief of your personal safety.
PLAYFULNESS IS A PIRATE
He is a disruptive rascal. His hi-jinks may put him in the spotlight, but his practical jokes and showing-off often result in serious bodily injury and even death. And note this: he, himself, has lost a leg! As so often happens, horseplay can boomerang and the practical joker gets hurt too!
AN INTIMATE LOOK AT FOUR VILLAINS
What You Should Know About Carbon Monoxide
This is a picture of carbon monoxide gas!
That's right, you can't see it. It's colorless, non-irritating, tasteless, practically odorless, but also deadly.
Here are the symptoms of carbon monoxide poisoning: First, a right feeling across the forehead, followed by headache, throbbing temples, weariness, weakness, dizziness, nausea, loss of muscular control, increased pulse and breathing. BUT if the concentration of the poison gas is high, there may be loss of consciousness without these warning signals.
Just a few breaths of air containing 1% carbon monoxide can be fatal . . . to one one part of carbon monoxide in a thousand parts of air when breathed for 90 minutes.
It is possible for carbon monoxide to leak inside of a car if there is a loose exhaust pipe or manifold connection, blow-out or exhaust gasket, cracked exhaust manifold, or leaky muffler. Play it safe.
1. Be sure your muffler and exhaust are in good condition (they can last long before they become rusty).
2. Always keep a car window open, even a little, for fresh air.
SAFETY LAZINESS IS A SNEAK LOSER
If you are lazy about safety rules, then accidents will have the whip hand. We are safety-lazy when we don't bother to use mechanical guards, to take time to get the right tools for the job, to wear protective equipment such as goggles, hard hats, safety shoes, respirators, gloves, etc. Yes, Sneaky Lazyness has a whole pack of accident hazards to trail you.
HAZARDOUS METHODS ARE A HOLD-UP MAN
This villain, unsafe work habits, likes to lie in ambush for the unwary. But how do we fall into bad working habits? It may be by trying to cut corners, by wanting to keep to the old way of doing things, or by over-confidence. It's hard for anyone to believe that an accident can happen to him. It's easier to make excuses to ourselves for ignoring safety rules, but others only lead us up a blind alley with an accident waiting in ambush.
Two Excellent Reasons
For Wearing Safety Shoes

EMPHASIZES SELF INTEREST

Your employee's self interest in his own safety is always emphasized. Constant safety consciousness is promoted by covering household hazards, transit to and from the job and on the job caution against accidents.

CLEVERLY ILLUSTRATES THE POINT

Artwork is carefully chosen to lodge home each point persuasively. The cartoon style makes YOUR SAFETY NEWS as familiar and welcome as the picture packed Sunday supplement.

WINS READERS WITH A FOLKSY APPROACH

Keeping the contents folksy, adding the light note of humor, gets your message across with a nudge instead of a bludgeon. Your monthly chat gets enthusiasm instead of indifference.

RIVETS ATTENTION WITH VIVID COLOR

Generous use of color sparks the message, and adds impact to the contents of YOUR SAFETY NEWS. Each issue is as alive as any news-stand favorite.

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YOUR SAFETY NEWS may be ordered with either the standard imprint or with your Own Special Imprint. The standard imprint reads "PLEASE COOPERATE FOR THE SAFETY AND HEALTH OF ALL . . . signed . . . A SAFE WORKER."

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